

made out by Mr. Blanford. This contradiction in the results of the two investigations, and the range of the variation here indicated, which amounts to 7 per cent. of the total radiation, make it sufficiently clear that, when every possible allowance is made for disturbing causes, the indications of the black bulb thermometer are an uncertain measure of the sun's radiation. The absorption coefficients for dry air and water vapour, now determined, agree, however, so well with those deduced from Mr. Hennessey's excellent actinometrical observations that they may be accepted with some confidence.

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III.—*Notes of a trip up the Dihing basin to Dapha Pani, &c., January and February, 1882.*—By S. E. PEAL, ESQ.

[Received June 24th;—Read August 1st, 1883.]

(With Plates II, III, IV, V and VI.)

The question of the treatment of savage races bordering on, and trading freely with, a civilized power, has always been a difficult one to solve. Whether at the Cape, New Zealand, America, or Central Asia, it has generally involved the paramount power in a series of petty wars, injurious to both sides and ending in the subjection, and too often the degradation, or extermination of the savage.

This contest—inevitable in the end, where the civilized and savage communities are in juxtaposition, is often regretted by the former, and efforts made to mitigate the result, which is well known among Ethnologists.

The treatment of the various savage tribes that surround Asam and offer such marked contrast to the Aryans of the plains, is therefore a matter of some moment. Most of them have no doubt had a common origin, their ancestors having peopled the centre, north, and east of Bengal, of the plains of Asam, whence they have been driven (by the advance of the great Aryan tide) to the hills around.

Looking back into the far past, we should probably see the whole of India a huge and almost interminable tropical forest. Here and there Jím clearings, with villages at some little distance apart, the houses of which, perched on pile platforms, would doubtless be the exact counterpart of those built by these hill men at the present day—and characterized by their length and low eaves. The spear and dao would be in every hand, and the dug-out on every river. To the latter these tribes gave names which survive to our day, and attest their presence. Head-hunting and tattooing would probably be universal, isolating and no doubt differentiating the communities then as now, for the extraordinary number and variety of languages and dialects on the non-Aryan basis, contrasts with the Aryan group, and would point to "head hunting" as the cause around Asam.

A conspicuous feature among these Hill tribes, and one to be expected, is their great intelligence in everything relating to their jungles, customs,

cultivation, or warfare, and equally conspicuous is their incredible ignorance of us and our power.

When examined, however, this is to be expected from their long tribal isolations, which precludes the possibility of their gaining standards at all capable of measuring us. They may see a good deal, and hear more, but the power of realizing it is absent, they must judge of us, our works and aims, by their own absurdly inadequate standards. This is a misfortune for them, which *we* hitherto have only partly realized, and is the cause to some extent of our failures in dealing with Hill savages, notably also do we as yet fail to realize the danger (to us) of their ignorance.

Anything which can remove this, now that we have settled as the paramount power alongside them, should be welcome to both sides, and taken in hand by us as a matter of state policy.

Missionary effort, trade, or pure travel, are all means whereby knowledge of us may be steadily and safely extended. The first is specially advantageous, and in most cases produces among savages such as these, the happiest results. Its advantages immensely outweigh all attempts at civilizing by Government in other directions, as secular schools, courts, &c.,—and is also much cheaper. Its effectiveness also is enhanced by the fact that Missionary effort is often self-propagating, the desire is natural among converts to extend to friends living in lawlessness and danger, their own quietness and peace. As a means of weaning at least one generation from their unruly habits, and head-hunting propensities, ere we absorb them as “subjects,” this argument is of the utmost importance. Missionary effort should precede by at least a generation, any attempts at settlement, and taxation.

Trade is undoubtedly one means of extending some knowledge of us, but unfortunately develops qualities of a lower order. The desire to cheat is innate, and both the desire and opportunities to steal, are often irresistible. Thus one of our difficulties with these Hill men is fostered and developed as time goes on, excellence in cunning ensuring success; thus the Missionary can do more good than trade.

The usual result of all attempts to civilize the unsophisticated savage right off is to exterminate him, there is need of an intermediate stage of some duration in which our civilized stimulants, and smartness are not experienced. A stage during which the savage surroundings and traditions can die down, if not die out, and render the new generation free to see, and adopt, what is advantageous.

Freedom to adopt our vices is hurtful, and our later civilization should so to speak be administered by a spoon. Unless we turn attention to these matters we shall find that the growth of “intelligence” among these Hill savages is also a growth in our difficulties in dealing with them.

Travel alone is one good means of disseminating knowledge of us and our aims, and of counteracting the endless series of rumours to our detriment. Notably useful is it in politics and our state relationships.

Formerly our Empire was scattered, and the need for consolidation by conquest and annexation imperative and patent. That day has departed, but its traditions remain on all our frontiers, needing reiterated refutation.

The experiences of travellers to the east and south-east, confirm this. On the present expedition the extraordinary and sudden change in every one, as soon as it was explained that I was only a "tea planter," out amusing himself was frequently suggestive and ludicrous. A Government officer is both dreaded and suspected, as a rule, when found travelling among these hills to the east. But apart from the questions of legitimate attempts by us, to favourably influence those around our borders, or explain our good wishes, lies the fact, that we stand almost as much in need of enlightenment regarding them, as they do of us, and that the results of our ignorance may be—indeed must be—a decided disadvantage to all. Anything which tends to remove that mutual ignorance, may be hailed as a decided gain. Large and highly appointed expeditions are here out of the question, or entail serious risks, the main obstacle being the difficulty of procuring supplies, and transport. On the other hand a small and unobtrusive party, can generally secure sufficient to enable it to push on, especially if independent of the need for "transport."

But while the benefits to be conferred and gained by travelling among the hill races on our N. E. frontier are clear to all who know the country and people; there are other matters of interest that can be investigated at the same time. *Commercial, Ethnological and Geographical* problems these await solution even if the discovery of a feasible route to western China be admitted as demonstrably impossible. The discovery of a trade route east out of Asam, viâ Patkai and Hukong towards the Shan States, had engaged my attention, since 1869, and following the example of Mr. H. L. Jenkins, I was enabled by actual observation, to determine the heights of Patkai and the Nongyang valley on the southern or Burmese side, demonstrating that the line taken by the Burmese of old was really easy and feasible, even for a cart-road, and not the formidable or insuperable barrier that so many supposed. I am here glad to be able to record the conversion of Mr. Lepper, to my views, the more so as he so strenuously opposed them for so many years. It is, however, one thing to find a route out of Asam towards the east, and quite another to find an easy one into western China.

Formerly most of us supposed that if once out of Asam, there would be little or no difficulty in entering China, the main difficulty of a trade route was supposed to be Patkai.



The travels and careful observations of, Gill, Baber, and Colquhoun, however, leave no reasonable doubt that our dreams of an easy trade route to western China cannot be realized, and Patkai is but the first of a series of increasing difficulties.

Exploration for the purposes of a trade route are more needful east than west of Irawadi, and the unsettled state of upper Burma, compelled me to look to the upper Dihing basin, as the site of this trip. The only European who had visited it being Wilcox in 1827.

The following is an account of my expedition during part of December 1881, and January and February 1882.

As on former occasions, I took my own load carriers, and depended as little as possible on getting "locals." To lighten their loads, and at the same time carry things securely from theft or temptation, I had 8 or 9 small Sasi wood boxes made to hold most of the things, and measuring about 18" × 12" × 8" weighing 3lbs. and with locks and hinges, 3 alpine tents of strong Jean, 7 feet square, and weighing 8lbs., poles included; when rolled up served as padded poles or "kanmaris" to tie loads to, and they enabled us to house ourselves comfortably in a few minutes, the whole load being about 30lbs. per man. Provisions for the men, such as rice, oil, salt, ghi, sugar, &c., I procured as we went along and laid in a good supply at the last of the little shops up the river. My own provisions largely consisted of Kopf's soups, sausages, Californian beef, dessicated soup, "coffee and milk" &c., in tins, also biscuits, butter, tea, and coffee &c. At the same time most of these were really carried as reserves, my daily commissariat being generally furnished locally en route, by presents or purchases of fowls, ducks, eggs and fish, or got by shooting.

Thus a traveller really need not fear a difficulty in carriage of provisions, until he leaves the inhabited tracts, and has to face 10 or 12 days of complete isolation.

As before when on similar expeditions I took a good kerosine wall lamp and a supply of thick buggy candles that require no stand; also arms a D. B. C. F. No. 12 shot gun, revolver, and a beautiful little Martini Henry Carbine weighing only 4½lbs. that carries to about 900 yards and has cartridges of 14 to the lb., a very handy little weapon that can be carried slung all day long with no fatigue. Presents of beads, strike fires, a few cloths, and electro mugs for the chiefs also, were necessaries, as well as a small selection of medicines.

Starting from Jaipur on the Dihing at Christmas we went to Makum by land which is a mistake, and travellers should at once take canoe for Bisa, or as far beyond as possible. Having to wait for Daks we camped early at the "Jura Pung" the road to which was along the boundary of the Makum forest reserve. The Pung is a salt lick and shews the remains



of the elephant catcher's stockade, ditch, and rampart, made in the time of Purundur Sing the last king of Asam, 1830 or so. Close by, the men found on a little hill top a grove of tenga trees, limes, shadocks, oranges, and citrons, and I measured a nahor tree 10 feet girth at 12 feet up and some 45 to first branch, the stem straight as a pipe, near by also were huge mekais, or *Dipterocarp*i 12 feet in girth and 100 to first fork.

For a considerable distance around the Pung, the jungle was a perfect maze of little paths of clean white sand, and one could easily get lost. Here, while two of the men were collecting dry logs for the camp fire, they espied some animal, and at once stalked it among the paths, taking it for a deer, soon, however, they became aware that it was stalking them, and that it was a remarkably fine tiger. Both sides simultaneously discovering that the other was not a deer, decamped in opposite directions, I went out but of course only saw the track, which measured 19" in circumference. As night closed in, the usual uncanny jungle noises broke out, the "Koot-Koot," or "Boot-Boot," of the large land Lizard or Gui up to 6 feet at times, in the twilight depths has a peculiarly unearthly sound, and the large owl called "Húndú," also has a sort of moan about the "*Húndú*" it utters. The three calls are by the *pair*, and not one bird, this can be often verified as they now and then sit in different trees, first 1 then 2 and 1 again. The clear scream, or yell, of the "Mor Sorai," is another of those weird sounds that night birds seem to delight in, and it favoured us several times, despite the firebrands flung towards it.

Next morning we had breakfast ere starting, and at 10 A. M. all the loads were tied and we got off, but I had to make my servant mark out our track among the paths by small fragments of paper dropped behind, for the Dak to come by. We soon entered a remarkably fine forest, trees of 100 feet to first branch, and 13 feet girth, not uncommon, and smaller ones pretty close. The undergrowth, largely ferns, canes, and herbaceous jungle on a sandy soil, the latter very red among the little hills we soon entered, the path going at times over, or among the knolls and up stream beds. Here and there Tokú palms, *Livestonia Jenkinsia*, rose to what all estimated as fully 50 feet, the huge fan shaped leaves spreading out above as a sort of green canopy. The Dak soon overtook us, thanks to the pieces of paper, and without which the men would have been "tried" all night fasting, and appeared (perhaps) at Dúm Dúma next day. At dusk we camped at the Powai having again made a very short stage purposely.

Starting about 8 A. M. next morning we very soon reached Makum on the Dihing, where we breakfasted, and I stayed some time getting stores and information. In the afternoon we proceeded again and camped at a small Duonia village called "Tora Kusi," as I heard that men from "Bor Kamti" were there.

These soon made their appearance, and I learned they had only lately come over from the upper Irawadi or Mlikha, together with some "Kunungs." Two of these latter I was glad to see and found them as pale or paler than the Kamtis, colour as near as possible 33 to 45 of M. Broca's scale. Hair straight and cropped *a la Mishmi*, no arms with them, and not tattooed. Though dressed like Kamtis in a white dhoti or waist cloth, and another round their shoulders, there was an unmistakably "Noga" cut about one of them, and it was some time ere I could detect that it lay in the way the hair was cropped. Later on I saw a good many more of them, and so far, they seem to unite the Noga groups to the south, with the Mishmi and Abor groups of hill men to the north of Asam, but their colour is paler than either. At the camp fire I learned a good deal regarding them, and the route they had travelled.

Next day we made the Kamti village of "Bor Phakial," the head quarters of the small colony of Buddhist Shans in Asam, and which I described on my last visit.\* I here found that the party of Kamtis over from Mung Kamti on the Mlikha or upper Irawadi, were staying at the "Munglang" Kamti village just below, so I went to see them, finding also several other Kunungs who it seems had come over in the same party, to see the wonderful country where all their daos went to. None of these Kunungs, and only one of these Bor Kamti men had ever seen an European. The information gained now was added to subsequently, and may be summarized further on.

At Bor Phakial I had many enquiries as to where I was going this year, all the better informed men at once declared it either too late or too early to attempt to reach "Mung Kamti," and that beyond Khomong on the Dihing three days east of the Dapha Pani I could not go (before April at least) as the snow had now fallen on the ridges of the water parting beyond, called on our maps, Phungan Bum, and occasionally by them "Bongan." The party, indeed intended to wait till April for this reason. They also represented my party as too numerous, and this I found true, for while it might not be difficult to procure cleaned rice at villages *en route*, for six or seven persons, it would not be so easy to get it for 12 or 14 without waiting a day. This determined me to reduce my party and 6 men were sent back, leaving me 5 load carriers, my servant, self and two boatmen or guides. These latter and a canoe I secured, and with them started up-stream the next day; the loads in the boat and the men going along the banks and sands, were crossed by the canoe at the deep pools. All hands assisted the boat at the rapids. As on last trip, we camped at the Tirapmúk, where the regular Noga hill route to Burma over Patkai emerges, *vid* Kheringams village. Next day we went on to

\* Vol. L, Part II, 1881, A. S. B.

Moko, near Nthem, and camped on the sands near the little Singphu village, where I found the remains of a large bund running due north to the sources of the Dibru, some 12 miles off the bund being called the "Pangori Gor." The ditch was to the eastwards and none of the villagers could tell anything about it, or the meaning of its name, though attributing it to the Ahom Rajas. In the early morning ere the fog cleared off, we were much amused by watching a large troop of the common "Bandor" monkey, collected on the opposite banks and gradually all swimming the river, a couple of hundred yards above us. The river being at its lowest and about 100 yards over. There were about 200 of them, and the very smallest crossed on their mother's shoulders, holding on to the head.

Many of them on our shallow side seemed to leave the water reluctantly, it was warmer than the air, by some degrees, and all scampered about on the sands to dry themselves. After some bargaining for fowls, eggs and rice in exchange for opium, we started on. The plan, being to draw entirely on local supplies where they can be procured, which saves those in store.

At "Paka-i-ling" where we camped again early, the river takes a bend past some sandstone ledges with a very deep pool. On the wide flat sand were the tracks of elephants, wild and tame buffaloes, tigers, leopards, and several cats, otters, lizards, turtle, large and small, the eggs being found, deer of three kinds, *i. e.*, horse deer or Sambur, Horina, and Huguri, or hog deer, monkey and bird tracks also crossed. Even insects left their mark, for in the drier portions near the bank the sand was quite pitted by the ant lion.

The following day we reached the Kerim Pani at 11 A. M. camping at Bisa, a little way up-stream. Formerly this dried suti was the main one, but for some ten years or so the water now comes down the M'ganto.

As there seems to be confusion arising as to the names of the rivers here—I may state that the term "Buri," as applied to Dihing from Brahmaputro up ends here, the upper portion of this river is simply *Dihing*, and the "no Dihing" is only that portion that broke out some years ago and flows to Sadia.

At Bisa I was obliged to stay several days waiting for another boat, the village consists of about 16, more or less dilapidated sheds, of the usual pile-platform type. Formerly it was of considerable importance as the residence of the Singphu chief "Bisa Banka," or Bisa Gam, and since his death in 1878, the place is of less moment.

The late chief's head wife, has now adopted as husband, Chaung son of Latua, one of Banka's brothers, and he is called "Gam." Eventually there may be a dispute as to who is to be Gam, as the late chief's son Chautong is now growing up and will be a smart lad. While here, my visit



was considered most opportune, as the Gam's wife before mentioned, had presented her adopted husband with a son, I was informed that had I not appeared auspiciously, it might possibly have turned out a daughter; I also here met a young Singphu chief from Hukong named "Urup no," who had come over to espouse Banka's second wife, a rather good specimen of a Singphu girl. Urup no, gave me some little information, and confirmed more, regarding Hukong. He had travelled down Dinoi for some distance, towards Somjok which he called Somshok. The Lanier, or nam Pagna, he also called the Pang-lai-kha.

Though anxious that I should see Hukong, and certain that I should be well treated, he told me, it would be necessary to obtain the consent of the Gams ere going, and that simply as one chief's son alone, he could not invite me officially over. He corroborated what I had before heard as to the difficulties being not so much of a physical nature, as the dealing with such a disunited series of petty chiefs all bent on extorting as much as possible, and in fear of no paramount authority. Passage from the Burmese side he considered far easier, if with the Woon's consent. I gave him a few sundries "to shew his friends," as he said, such as a spring tape measure, and electro table-spoons, also a few sorted beads, among which large red and blue bugles, pleased him immensely, not that he would wear them, for Singphu men do not care for beads, but as something quite unique.

As a sample of a chief's son, he was above the average perhaps—tall, well built, a fine expressive face, plenty of long straight black hair rolled up in a knob on top of his head, good hands and feet. His manner was authoritative and at times excitable, and when playing a favourite game with cowries and dice, he could dash them down and yell out as loud as any of them. The little M. H. carbine of course took him immensely, and the accuracy of its fire at 200 yards, at the same time he recognized its uselessness to them on account of the difficulty of the cartridges.

I also here at Bisa saw two more of the Mung Kamti party, and learnt a good deal from them as to how the Kunungs smelt their iron ore which is of two kinds, stone-like, and sandy. It is converted in a small furnace of hour-glass shape, to which blast is applied from 6 or 8 pairs of the usual vertical-tube bellows, the pipes from which converge to the furnace, in the centre, and relays of men work the blowing. Fresh ore and fuel (of charcoal) is now and then added, and after about 12 hours, the ore is formed as a flattened lump at bottom weighing about 4 to 6 seers. Hammers and anvils are of stone, the former held by a creeper and often with two handles. The bellows, a pair of tubes made of the large Wra bamboo, with feather-edged pistons and vertical rods to hold, there are no valves I believe.

A little rain fell while we were camped here, which all were glad of, as it was bound to come on us otherwise when travelling. We also laid in stock of rice, sugar, ghi, oil, salt, flour, tobacco, and on the 5th went down to the river and met the canoe Chaung had lent me, a large party of Sonkap Nogas down about rubber, passed me on the bank, and as before in 1879 sidled and scuttled past, as if in fear of their lives, turning round after for a good stare, quite a contrast to the Nogas of the west, where they see Europeans often. Their chief stayed to look at the little rifle, and was rather astonished to see the bullet from it fall close to a snag at 400 yards off that I aimed at, in the water.

As our guide Lutak Kamti desired to get a mate in lieu of the one who returned with the other canoe, I camped at once, and in the morning he came with a middle-aged Singphu named Thang, a right good willing fellow, and the only drawback to him was he could not speak Asamese, he was quite equal as a rule to the work of two ordinary men, and said nothing about it. These two managed the boat and foraging at villages, Lutak being interpreter.

From all sides I had heard that we should never get the canoe up M'ganto, and the prospect was not pleasant, as for three or four days after leaving Jagon (the next village) there were none near us, and the country was wild; however I trusted to get up as I did Namtsik, where at the rapids all hands in a line cleared the worst of the boulders from a narrow (2 feet) channel and then dragged the canoe up, the same channel serving to return by.

At night it rained, and we had the pleasure of hearing at once a tiger on each bank, giving their loud sharp whistle, so well known to all jungli-wallas. They seem to indulge in it mainly when hunting, and hence can be distinguished at once from the leopard, with his deep "haunk-haunk," whence he is called the "Hawkra Bagh." The tiger's whistle is loud and sharp, closely imitating that of the Samber deer, and may be due to natural selection, as the deer go to the sound, as hunters well know. The whistle of the tiger, however, can generally be distinguished from that of the Samber. The peculiar "creep" it sends up one's back seems due to association, as I know a man who used to go out whenever he heard it, unarmed, to try and "see the deer," as he thought, and never felt anything but curiosity, until the case was explained.

The roar of the tiger again is so like that of the elephant that few can tell the difference, and as we heard it also, were not certain that elephants were near, until we saw the tracks next morning.

At dawn the rain left off and after breakfast we loaded and started on, most of us on the sands and shingle meeting some Nogas who had come about rubber from Numyung side, about five days beyond Patkai, some among

them wore the peculiar little narrow slip of cloth tied tightly between the legs, that keeps the testacles in the abdomen, and which is common among the Soukap, Namtzik, and Tirap Nagas. We soon reached Jagon a small Singphu village and as it was our last village for some days and I had to get opium from the Kyah there, we camped just above it. Here I noticed many mounds, bamboo clumps and some trees, that the inhabitants who were Singphus, declared must have been remains of Ahoms in former days. I also saw and sketched here, a "Gabru Morong" or house in which all the single girls of the village sleep. All through these hills north, east, and south, the various tribes have a peculiar custom in common, and under various local names. It is that the single folks (generally the lads) have to sleep in separate houses called by Asamese, "morangs." These are of two kinds, *i. e.*, the Deka morangs, of the grown young men, who also act as guards, their houses being often on the outskirts or outlets of a village, and the little boys' morangs, where they all sleep together, and are under certain laws or regulations of their own. In some villages as among the Bor Duria Nogas there are as many as 10 and 12 Deka morangs, several boys' morangs, and three or four, for the unmarried girls. Incautious or abrupt questions regarding these latter, especially by strangers are apt to produce denial or evasions, as these hill men well know that our ideas of chastity are not theirs. But at times they speak out plainly. Lately a "Bor Duria" Noga who was giving me a list of his village morangs, in reply to my query as to whether the young men went to the girls' morangs, said "na pai, na pai, dinot na pai," not in the day, they would be ashamed, but after dark after all had eaten, then they went and all had great fun, it was their custom.

Among all these tribes this is more or less the custom, and we may truly say their chastity begins with marriage, juvenile chastity is not the rule, but the exception, I am aware that this is contrary to the recorded opinions of many; nevertheless I am sure it is true, nay more, it is apparently a race character of long standing, undoubtedly existing among these hill savages ere their dispersion by the Aryan invaders. We see this identical custom now among the races, north, east, and south, of Asam, races whose languages (originally from one stock) are now so different as to be quite mutually unintelligible. The custom also is so similar and peculiar as to preclude the idea of separate origin in each tribe. Like the "pile platform" houses we see among these same races, it appears a relic of very high antiquity. A custom that has survived the dispersion of these tribes from some common centre, and proof of original unity. To anthropologists it is of value as a link joining our present system of morals with the pre-historic past.

As we see the custom about us, it generally appears that the unmar-



ried have to sleep away from the parents' house, at times only the boys and young men, at others the young women and girls also, but in this case they have different houses, though all are called by the Asamese "morangs." Among the Bordurias, Mutons, Banparas, Jobokas, Sanglois, and the tribes near, they are called Pá, (pah); west of the Diku river I hear these morangs are called "Ari zu," and there are different tribal names for them among the Singphus, Mishmis, Miris, and others, on the north or river bank of the Brahmaputra; attached to them are I hear fixed rules or laws, which it would be most interesting to collect and collate, and which may doubtless yield a clue to their origin. Viewing the "morang" as a phase of social evolution, it is probable that we have here before us one phase or form of the transition from original sexual liberty, to our institution of marriage and modern ideas of chastity.

The idea that sexual fidelity begins with *marriage* is here obvious, and almost implies that the institution began by capture, or purchase, giving a pair the right to live separate, as has been urged by many. A curious feature of the case confirmatory of this, is, that sexual infidelity by the female *after* marriage seems rare, much more so than among civilized communities. At this Jagon village there was only one morang and that for girls, the allusions to it I heard when we were returning, were unmistakable.

After starting next day I stalked a pair of the large brown Brahmini duck, a wary bird on these open sand flats, and only to be got by wire cartridge or when flying over. It then occurred to me, to note the relative distances at which game of all sorts takes alarm, a great deal depends on the presence or absence of cover. As a rule wild buffalo, or Gaur called here Mithon, moves at 300 to 400 yards, pig and deer in the open 200 to 300, but in forest these often stand at 100 or even less. Tiger and leopard, if in the open, make off at from 100 to 200, though I have known the former on a path in front of a man, to walk aside some 20 yards *to let him pass*, and quietly walk on after he had done so; most monkeys scamper off at 50 yards, and do not mind being seen. The Hulok or ape on the contrary though arboreal, can seldom be seen, at least within 50 to 100 yards. Otter become fussy and try to frighten one at 80 yards, but if quiet they will often come quite close. Turtle generally drop off the snags they rest on, into the water, when I get to within 30 or 40 yards. Among birds there is a marked difference between the vultures as a group and most others of equal size, unless they are habitually protected, like the wild geese on the Sibsagar tank, storks &c. Insects seldom rise before three or four yards, while those that mimic inanimate objects can be actually pinned often ere they attempt to move. Probably our ancestors soon became expert missal throwers, and this differentiated them from the nearest allies. But to re-

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sume our journey, by 2 o'clock we reached the mouth of the Namrup river, up which on the last trip I travelled for Patkai and Nongyang. It was now deep and sluggish at the mouth, while the M'ganto we now entered was conspicuously shallow and rapid, the water being remarkably clear. Inland all along on each side, was much the same jungle, as below, the same tangle of rattans, creepers, tall grasses, and tora or wild cardamum, 15 feet high. The trees of the ordinary Asam mixed forest, Modar, *Erithrina Indica*, Simol, or cotton tree, *Bombax malabaricum*, Sahm, the wild jack *Artocarpus chaplasha*, ajar, *Lagerstrœmia Regina*, figs unlimited, (except *Elastica*) Acacias, Eugenia, Michelia &c., &c. The huge reed-grasses as Nol, Kugra, &c., covered the edges and flats wherever possible.

Snags were plentiful all along but in the M'ganto remarkable for their numbers and size. At one place where there was a channel of deep water spanned by a huge stem, we all used it as a bridge, and the men said a canoe of 150 maunds could be made out of it. The large and straight stems I met with here and there fit for canoes struck me forcibly.

The regulation taxing all timber of certain kinds found in the river beds, might well in these wild places up-stream be suspended, the more so as in this same river Dihing lower down as much as Rs. 2,000 has this year been actually given by Government to remove by employed labour the snags and trees so dangerous to navigation.

Probably the regulation taxing the drift timber was instituted to meet cases where men might otherwise fell and float off timber growing near the banks, but apart from the fact that this of itself would be doing a service rather than the reverse, it might be borne in mind that the total harm these people could do as at present organized, could not possibly equal even 1 per cent. of the loss constantly going on through ordinary natural decay and storms.

Our camp was pitched at the tail of a small island four or five bends up the M'ganto suti, on sand close to a rapid and while some pitched the tents, others took the canoe as usual and got in a lot of large and small dry logs and branches, for camp fires and cooking. The tents and the guides' bivouac of leaves, generally formed a cross with a roaring fire in the centre, and small ones outside. With large fires no one would mind much the visit of either tiger or elephant. The wild solitary male buffalo was the only one we desired to keep clear of, as they frequently charge madly at anything that is strange, and disregard firebrands. Our three tents would certainly have been unbearable, luckily the only wild buffalo we came across were in herds or females.

After an early dinner I issued some "tea" and we had quite a jolly party round the fire, I usually lay at full length on my bedding and listen-

ed to the stories, or *guided the conversation*, in the dusk after dinner. The moon also was out and lit up the scene, and made us feel a little more at home.

I noticed our guide's mate Thang, both now and subsequently, very careful not only in how he tied the canoe in case of a rush of water taking it adrift, but also in the selection of a site for it, on enquiry it turned out that his caution was to enable us easily jump on board and push off in case of any sudden emergency. The old fellow was full of "wrinkles," though we probably did not see half of them, from his not speaking Asamese.

In the early morning at dawn we heard in the fog, a bear coming down along one bank, but though we all kept quiet, he turned off, ere he came near, perhaps having winded us. It is very curious that bear tracks are so seldom seen on the ground, and yet so very common up and down large tree stems. Judging by the tracks alone, here in Asam, one would suppose (of course erroneously) that bears were entirely arboreal. To one track on the ground, I have probably seen as a rule thousands on tree stems, one reason is that the latter remain, and those in mud or sand are soon effaced. At times they make what the Asamese call "nests," in trees, and I have examined several unmistakably made and used by them. They are, however, only "roosts," made by clawing in, and breaking, leafy branches that grow near, so as to form a comfortable place to sit or lie on, in the sun. I have seen as many as three in one tree, at various heights, the lower two broken with branches hanging, where they said the bear had, in rolling about, gone through; in all three the foliage had turned brown while the rest of the tree was bright green, and these roosts were thus conspicuous; the tracks were plentiful as marks and scratches on the tree stem but on the ground none. Generally the marks on a tree stem are those of the five claws.

At about 10 A. M. we got off as usual after breakfast, and found the rapids rather troublesome. At one place, going along the bank near a flat, all covered with high tufts of ekra grass, an Asamese on ahead suddenly bobbed down and pointed in, and creeping up we saw at about 100 yards a very large female wild buffalo, quietly browsing, and as usual a lot of mainas about, and on it. We waited to see more but she seemed alone, and had the long thin horns usual in some females. Later in the day we saw another, and while watching it grazing, several others appeared, eventually we counted nine and no big males. The four Asamese and the Kamti Lutak would not of course eat buffalo, and thus there was only four who would, *i. e.*, myself, a Kachari, my servant, and the Singphu Thang who would have eaten several shares, so I selected a calf and fired with the little M. H. C. at about 200 yards, not being able to get nearer. At once several other



buffaloes rushed up and they formed a group and then rushed into the jungle alongside, the wounded one among them. On going up we found blood but to follow them in such jungle was madness, and we had reluctantly to lose the calf; we subsequently found that a party of rubber-cutters had come across it dead, and jerked the meat.

Further on we passed a cunningly selected camp site, of five men who had been out elephant shooting. The ease with which the signs were read, the story completed, was noteworthy. Not an item escaped, it was no mere guesswork either, as they could explain their reasons for all they assumed.

About 3 P. M. we camped on what is an island in the rains, and whence we had a fine view of hills to the north-east that turned out to be beyond Mana Búm. In the morning we saw snow on a spur of Dapha Búm called Joitho, but it soon clouded over. A male and female Samber had been quite close to our tents in the night, their tracks plain in the sand; this latter became gradually less and less, and gave place to shingle which is not so comfortable to sleep on.

At dawn or as soon as I was up, old Kamti, as usual, brought me some beautifully baked yams, white, flowery and piping hot, with some fresh butter, they make a capital start for *chota haziree*.

In the night the men found the cold so great that several got up and sat at the fire and half asleep droned out long monotonous ditties, the thermometer several nights stood at 45°, which in moving fog is pretty chilly.

Again after breakfast we went on, and had some stiff rapids to cross, at about 3 P. M. again, we reached where the No Dihing forks, in a wide flat valley with islands, while hills right, left, and beyond broke in view, the best certainly seen so far. The extent of the great shingle beds and banks, however, was the feature most noteworthy. I had expected to see something where a little engineering might be expected, to work wonders, in the water-courses, of either river, but as I stood there the idea of the attempt even with hundreds of labourers looked absurd, evidently in the rains these huge shingle flats are submerged, and all little efforts at cutting or damming would be obliterated.

This question of the diversion of the waters of the upper Dihing wholly back into their own old channel, down Buri Dihing, is likely to come up in the future, as the need for more water in the dry season for steamers arises. Having this in view I examined the lay of the country at the bifurcation, and went over the great shingle beds, taking note of their size and elevations. About half the total quantity of water just now was passing off, *viâ* No Dihing, and from where our camp was pitched, on the long spit dividing the two rivers, the levels were pretty much the same,

if viewed from either river or the central ground. A leading feature in the case is that for some distance down, either the No or Buri Dihing, there are frequent rapids with a fall at each of several feet, the channels in both cases lying well *below* the general level of the wide shingle flats on which the river divides, but quite an infinitesimal fraction of the total *water-way* as seen in the "rains." Thus while it might be possible by considerable expenditure of labour at the end of the rains to increase the flow down one particular river, as the Buri Dihing, by removal of shingle at the first and second rapid, at the fork, all this work would be quite obliterated by the ensuing floods of next year, which shifts the shingle and fills all depressions. The possibility of so far altering the channel as to render floods of extraordinary height likely is very remote. This indeed is not possible physically as long as the No Dihing outlet exists, only if this were completely closed (as it was originally) extraordinary floods might occur, (due to upper Dihing water) and for such occasions the Asam Rajas provided the bunds or Mataoris we see lower down along each side of the river some way in. If these are kept in repair there need be no alarm felt by residents on the Buri Dihing. On the contrary if they have anything to fear, it is that the whole river at least above Namrup may eventually take to the No Dihing branch and aggravate the present difficulty regarding *water in the cold season.*

Those who look at this question must remember that in "the rains" there is no likelihood of water being too low, the northern drainage from Patkai on which rain falls freely from the Namsang sources to those of the Namrup would alone give ample. It is in the cold season when the Tirap, Namtsik, and Namrup run dry, that the more elevated sources of the Diyun Kha and Daphapani hold good, and from whence a large proportion of the Buri Dihing water comes. The natural tendency would seem for this upper Dihing water to flow more and more *viâ* the No Dihing and cut off these cold weather sources from the old channel.

Early next morning as expected, I had a fine view in dark outline of the Dapha Búm, and the ranges beyond to the south-east, called by us Phungan Búm, the crest of the latter remarkable for its rugged and turretted skyline as seen through the large telescope at dawn with a power of 100. Both groups were more or less snowed, and the crests presented the decided, rugged, and hard outlines indicative by its texture, of bare rock, which whereabouts is one key to elevation.

As the light increased the view became better, to the south-east rose Miao and Wahambo over 5,000 feet wooded to the tops, and their lower spurs flanking the wide flat valley on that side. In the distance due east, lay the N'chong Búm, at the foot of which flowed the Dihing, behind it being the Phungan group. Towards the left rose the series of peaks culminating

in Dapha Bum, 15,000 feet in front, at that side lay Katoh, and below it the smaller "Mana Bum" ridges. Here and there in the open flat of the valley wooded islands stood out clearly and broke the monotony effectively. With the exception of "Maium" peak 6,939 feet no part of the Patkai was visible, and it was seen with some difficulty in the haze. After enjoying the view for a couple of hours making some notes, and having breakfast, we started on, and soon passed what is an island in the rains having trees on it, the age of which I estimated at 20 to 25 years, and another one beyond, at 12 to 15 years. We soon came to the end of the dividing spit as seen now at least (in the cold season), and found the Buri Dihing water pouring down a rapid at one side, with a fall of probably 4 feet in the first 50 yards, the shingle was all large, and in crossing at the head of the rapid, wading was not easy even though the water was not more than a foot to two feet deep. The stream was very strong, so much so that very little force sufficed to start the large stones rolling down. Except at the very throat of the rapid the bed was wide and flat for considerable distances all around and it would have taken a large amount of work to carry the gut of the rapid (as a depression) up into the wide, shallow, and swift sheet of water above, so as to drain it off. If done, however, there could be no reasonable doubt, that very little of the water would have reached the No Dihing.

It took all hands to run the canoe up, and at one time I feared she would be filled; however, we got her up all right.

As we went on we found it true that gradually the sand would become less, and give place to shingle. I had brought strong lace boots with projecting screws in the soles, but soon discarded them for wading shoes similarly screwed. Here the latter were particularly suitable, as the stepping from stone to stone for hours, and at last days, makes one expert, and it is necessary to be "light-footed." Boots become at once filled with small pebbles, at rapids, and cannot be as easily taken off, or put on, as shoes. Pantaloon should be wide and cut off just at or below the knee. Some light material (as strong jute), is preferable; and two or three pairs should be kept handy to change after each wading if wetted to the hips. I hardly need say that about eight or nine good large pockets, are indispensable, and an orderly with as many more, close at hand, who should carry shot gun, binoculars, and sketch book, &c.

The rapids up here we found far worse than those below, in M'ganto, and the whole river-bed was covered by much larger shingle, even over the tops of the wide flat islands, where in floods the water must sweep with immense force, great tree stems were piled up here and there and jammed into masses. In other places the cold weather scour had undermined the banks of shingle so far at least that the stones often rested more like a



wall, or steep slope, the slightest touch often sending large boulders rolling down, that started others in turn.

One rapid we met was particularly difficult, and took us a full hour to ascend, at another soon after, we cleared a channel where it was shallow, and so ran the canoe up a little track fully a hundred yards. These rapids at last were about four or five to the mile, and made progress slow. Later in the day we suddenly met five or six Singphu women and girls out fishing, and they gave us some they caught, begging in turn for some opium. They were from a village called Ndong not far off. This was rather a hard day's work and we camped late, *viz.*, at dusk; I issued some tea, however, which cheered them up after dinner. Just ere going to sleep we were all surprised to see two Singphus appear, with some fish; they would not stay and promised to come in the morning and take me to their village.

At dawn for a few minutes I again had a good look at the hills ere the mists covered all in, and it seems true what these people say, that the best time to see their hills is at the paddy-cutting, about November, or end of the rains.

While at breakfast the Singphus came and some of us started off inland, crossing large flats, of river formation, sand and boulders, covered by grasses, and here and there having water-courses, now dry. After a couple of miles of these island flats, we reached the land proper, though here and there we still saw boulders and bedded shingle. At last we arrived at their village of Khagam, which was a collection of more or less dilapidated sheds, on piles. Of the large "Wra Bamboo" there are several planted clumps, as usual at all Singphu villages. The people use the joints for buckets, and some I measured were 20 and 21 inches in circumference, and about 80 feet high, growing remarkably closely in the clump.

The enquiries for tobacco, (Sadr Dhopat) were here a positive nuisance, opium and tea also, they seemed to know only too well. The large number of children struck me, and I afterwards found my men had noticed it also. To all appearance there may have been six or eight to each house, and two to one compared to the grown people.

*En route* on we had crossed a small stream which they call the Manmo, or as we should call it Bamo, and it is named from that place in upper Burma. Passing on we came to another village called Phúp, near which I obtained the only view of the Patkai crest near the Nongyang pass. The haze was considerable, but I could see that the crest towards the east was lower than at the pass, and over it ran the Loglai hills that divide that river from the Turong. Returning to the river near Loang I found the men vainly trying to get the canoe up a bad rapid, so I decided to leave her in charge of the Gam. We therefore unloaded the boat and camped.

A very smart and intelligent young Singphu, whom I had allowed as

a favour to carry my little rifle from Phúp turned out here to be the Bishi Gam's son. He could not speak a word of Asamese, but I sent word by him that I should pass through his village next day, and should need some rice. His father is rather an influential man, not only on account of his intelligence, but from the position of his village which may be called the last on the line from Asam to Mung Kamti. Khomong at five days further on being about the half way house. This compels all travellers to buy paddy at Bishi both going and coming and thresh it out ere starting again.

While at this Loang Ghat, I had several applications from women for medicine to cure goitre, of course in such a limited time and without a special stock of Iodine, I could do very little.

At these Singphu villages I observed a cultivated variety of *Plectocomia* (the large cane); the seeds are eaten. The stem and leaf stalk is almost completely destitute of the spines generally so densely set all over both, and the midrib. Unfortunately I could not procure a single seed, though I bid well for it, nor could I get a flower as it was not the proper time.

Next morning after breakfast we packed up all our loads, handed the canoe over to the Loang Gam's charge, and started for Bishi. We passed some suties of the river from which the water had been cut off and where the villagers of Bishi were fishing. *En route* we saw some of the rice fields, and bamboo clumps, where villages of captured Asamese had been interred by the old "Dapha Gam" in former days. These Singphus used each cold season to raid Asam and carry off slaves which all ended in our expedition under Col. White (?) and the Dapha Gam's retreat, first to the Mbong yang and thence to Hukong, where his descendants now live on the Dinoi east of the Turong and Tsak tsai.

The path into Bishi from the west, is over a low spur from the Mana Bum ridge that comes down quite to the river, and a little east of the village ends in precipices, spurs from the Miao Bum also approach from the south and do the same, so that Bishi is really situated where the valley is narrowed to a sort of gorge. The village, however, is on an alluvial plateau about fifty feet high or so, and the site is open, the hills not being high.

A straight and level line edges the river on the opposite bank, and suggests a similar alluvial terrace there also; in which case it seems likely that these terraces were at one time part of a large plain. This feature appears here and there all the way on hence to the Mbong yang where it, so to speak, culminates, and is seen in situ, as a large plateau. The Gam and all his people were out at the fishing, but I was agreeably surprised to find his village quite a contrast to the others, all

the houses were in good repair, the chief's especially, there was a look of substantial prosperity about the place, and the houses were mostly in a regular row on each side of a wide sort of road, the Gam's at the eastern end. Not desiring to camp actually in the village where dogs and pigs are a nuisance, we descended east to the river, and found just enough sand to pitch the tents on in a depression of the bed now dry. In the evening I sent the guide up with a pocket flask filled, for the Gam, and a smaller one for his son, also to explain matters a little, as otherwise the visit might be unintelligible. In the morning he came down, with some of his people, and I at once saw in him the best Singphu chief I had seen so far.

He was above the average in height, and proportion, about 40 to 45 years old and held himself upright without any affected airs. Features large and strongly cut, but a quiet kindly and shrewd look, that became him as the "father" of all his people, old and young. The only difference in his clothes, being, that his were quite clear. In speaking I could see that what he said was generally to the point, and well weighed. Altogether he was by far the best sample of what a chief should be that I had met. From where we stood he pointed out on the hill just above us, the clumps of Wra bamboo growing now, that were planted by the Dapha Gam, at his village, which was on the hill.

The difficulty of reaching Bor Kamti he explained, and confirmed what others said, as to the likelihood of having snow on the passes, which all these people seem to consider a formidable obstacle. From Bishi to Dapha Pani, is usually two days, thence to Khomong (last Singphu village east) another five; from Khomong the path leaves the Dihing (or as these people call it *Diyún Kha*) and crossing the Songsan Bum (which I believe is a southern prolongation of Phungan Bum) reaches and goes down the "Mung lang Kha," or "Nam lang" and over other spurs to the Bor Kamti villages. Another eight or ten days, or total from Bishi to Mung Kamti about fifteen days. The path beyond Khomong he declared difficult, and said it went large part of the way up or down gullies, that practically there really was no track or path at all, the danger to a party like ours being, that if any accident occurred, we should certainly run short of provisions.

All parties going to or coming from Bor Kamti had to carry at the least ten days' provisions, and this made the journey between those places difficult to those carrying loads for sale or barter like *daos*.

The difficulty of transport of a Commissariat indeed we saw now ourselves, for I had to ask the Gam for three men to carry rice for us to Dapha Pani, as I calculated I should be absent from Bishi fourteen days, and get no supplies elsewhere meantime. Knowing that the Singphus and Kamtis when travelling cover great distances compared to what I should



do on a trip like this, I allowed double their time, *en route*, and for six days to camp at the Dapha Pani, total fourteen days.

The Gam and his people had an idea that Europeans cannot walk or climb, and spoke of the difficulty I should meet in surmounting Nehong Búm, that we saw lying as a ridge across the end of the valley eastward, which from Bishi, again opens out as a wide flat tract with low hills on each side. I had an idea that I could get along better than they expected but kept this to myself and was glad of it, as I thereby had a key to the difficulties of the route in other places, I here had to bargain for more rice and found that they would only take opium in exchange, at the rate of six seers rice per tola of opium, but as the local rate for opium was eight annas and twelve annas on our return, and mine was bought at  $5\frac{1}{2}$  I did not lose so much.

Money is thought less of, as the rubber trade enables them to earn it easily at times for Re. 1, and even, if lucky, Rs. 2 a day, and I have heard of a Naga making at the rate of Rs. 4 a day for a week.

A lot of women and girls and boys came to see the big telescope, and as it magnified to one hundred diams. (if necessary) were pretty much astonished; the binoculars, and a smaller telescope were also in request.

The Gam was much struck with the revolver, and its range which I could shew him by firing down the river. The little M. H. Carbine also as usual was a surprise to them all.

In the afternoon I paid a short formal visit to the Gam's house, ere he went out to the people fishing. I noticed the elephant ropes or phands, hung in his roof that are occasionally used hereabouts by the Muttok Gosain. The ploughs also, four or five, were all slung up in a row so that a little smoke might help to preserve them from the attacks of insects, the Chinese cast iron socks all removed and stowed in doors. His wife was a homely and sturdy woman with no pretensions to beauty, though she was evidently a good house-keeper by the number of hens, and their nests I saw, and the various odds and ends I could see from the outer compartment, beyond which I did not go. The total length of the house might be 90 or 100 feet by 30 and divided into many compartments in which the various members of the one family live; a strapping big daughter was married to a Singphu who lives with them, and who was nursing a youngster. The Gam's brother lives in the next house, also a good one.

Having arranged regarding the rice, some vegetables, and three men extra, also about leaving a few of my boxes, with stores for the return journey, in the Gam's charge, we went down to camp again, I had a long talk with an old man who spoke Asamese. Next morning after weighing out the rice and tying it up, settling the loads which the Singphus shirked (as usual), issuing a little tobacco to the ladies, old and young, who came to

see us off we made a start. I noticed the Gam go round to each of the four men who went with us, and give him a little screw of tobacco and wish him luck. The men with loads at once waded, but an unloaded man would hardly have got across that way as the stream was so strong and waist deep. I and the servant and guide crossed on a bamboo raft, kept here on purpose.

On the off side is a large flat chur quite open and used for grazing cattle on, a small offshoot of Bishi called "Pen gaon" being on the southern terrace flat, as Bishi, is on the north one; on the map it is marked Kasan, and in Wilcox, Kusan, which the people did not seem to recognize, until my guide pointed out that they were of the Kasan Singphu clan. Passing the cultivation to the east, we emerged suddenly at the steep edge of this alluvial terrace, from whence the view is very good, as it overlooks the valley for some distance and shews the hills beyond well. The bottom of the valley was a wide shingle flat, here and there cut up by water-courses mostly now dry, and with scattered rather irregular forest, the hills at the flanks being very low. The valley which is constricted at Bishi, by hills coming down on each side now opens out and is about eight or nine miles long by one or two broad, the wooded hills on the right (to south) rising pretty steadily to Wahambo and Langu búm, as shewn in Col. Woodthorpe's map, which is careful in detail. After passing the Kachong and the opening to north where the Pakan comes out, we camped, where there was firewood, at an old shanty built by rubber cutters, and were soon all housed. Had we started early, we could easily have reached the Nchong Búm, as I afterwards found out, *i. e.*, the usual march from Bishi. But as I was out as much for pleasure and health as anything, I did not attempt to force the pace, or camp at certain defined spots at all risks; besides I always made it a rule to camp early if possible, *i. e.*, while there was an hour's sunlight, at least. While at dinner we were all surprised to hear a gun go off about a mile away, so after an interval of about a minute I fired my carbine, as reply, and to invite the other party over. No one appeared but as they turned out to be Mishmis, (probably after elephant) it is likely enough we were examined after dark.

In the morning at 9 A. M. the air was 66° and the wind as usual from the E. N. E. and we had a beautiful day. We soon came across the Mishmis, three men, two girls, and a Singphu son of the Dungan la. While the guide was talking to them, one of our Singphus pointed out where there was a lake up in the hills, which he saw when searching for rubber two years ago with five other men, on Langu búm. The summit of one of these hills they found quite inaccessible, though from below it did not seem particularly steep. At the extremity of the valley where the path crosses the river, we had to wade, the Singphus at once stripping and tying their

few clothes in their huras, or baskets. After all were in, I saw that where shallowest, the stream was strongest, so I took a middle course. The nails or rather *screw* heads in my shoes, were very useful as the stones were so large and slippery; a stick was indispensable, not put in down-stream though, to save one going that way, but up-stream to lean on; in fact, if put down-stream it could not easily be forced to the bottom, whereas up-stream the moment it touched the water, it went to the bottom "like a shot" and stuck there, if put in at an angle. The water was up to our hips, and only one man, my little Kachari Bhodai, had to be assisted. After a short distance we came to another rapid that had to be forded, a very ugly one below, where the water all rushed close under precipitous rocks, neither I nor the guide were then aware that really there was no need to cross at all, so we all went in for it. I, however, made the Singphus go over first and then return to assist if needed, and having donned my swimming belt as a precaution, walked in.

At first it seemed all right, but the boulders were such a size in some places, two and three or more feet across, that they caused eddies, and in turning to avoid one in front of which the stream had scooped a hole about four feet deep, I was suddenly aware that I had stuck and hung poised as it were a moment.

Sideways I had got on all right but the increased resistance in facing the stream three to four feet deep made a difference. Nden gam a powerful young Singphu, accustomed to all this, at once came towards me, but I managed to get on, and pointed him to little Bhodai behind, whom he took in hand just in time, as his load had touched the water, (and wet all my clothes), as they all said again, "loaded people get on best, as they have more hold of the bottom."

Each person took about five or six minutes to cross, and in this case I went in at times to the waist. We were now close under a pretty high hill and a strong cold wind blowing made us pretty cold, but we pushed on, and came to where the Dungan Kha falls in from the north, and the Dihing emerges from the south-east between the hills, in a gorge. The place is called Dungan yup.\* Here we discovered that if we attempted the ascent of N'chong búm that day, we should again at once have to cross at another bad ford, so rather than do this and to give time to dry clothes I camped. We had, however, not selected a good site. It was all right in fair weather, but after an early dinner it clouded over and we heard thunder, our tents were pitched on the sand, in the middle of the gorge with high hills on each side, and seeing this I had the edges of the tent sunk some 6" in the sand all around, and good large stones piled in a row all around outside; lashings all doubled and some branches held to wind-

\* Yup in Singphu "sleep," a resting-place.



ward by stones, to break the force of the wind which now began to rise. It was hardly dark ere the storm broke. The thunder rolled and roared as it only can in the tropics, and the lightning played here and there as a constant flickering blaze. Rain fell as heavily as it well could, but my water-proof was lashed taught outside, and though I hardly expected it, I rode out the storm which lasted some three hours, without getting wet. The men though they had a large water-proof got wet gradually, and in the early morning at dawn, I got up and donning my great coat (which I never needed so much in my life before) I got in some logs and tried to start a fire. It was, however, useless as the wind was a perfect hurricane, blew all but the big logs clean away and I had to start and build a low stone wall of big stones, to windward. By filling the larger holes with sods, I at last got shelter enough to try again, and arranged the firewood and logs, ere I struck a light; by using up half a candle I got it caught at last, and it soon was a fine blaze. I looked in and saw the men asleep still and roused them, I made my servant issue tea for a big brew, that soon put all square; such wind, however, they all never experienced before. The guide, four Singphus and Thang, as soon as they saw the storm coming, ran from their bivouac near us, and made for a couple of big holes in the bank under the stem and among the roots of a huge tree; where, at five feet from the ground, they crawled in and lay all night in fear of the tree falling, in which case all were at once dead men. Old Lutak said he had not closed his eyes once, and he certainly looked like it. It was some time ere the driving clouds, down the gorge, allowed the sun to come out, and meantime we had breakfast. By this time we spied men in a shanty on the opposite bank but could not be heard as the rapid was in the way, yesterday on our arrival here I forgot to say we came up just as two Singphu men and one woman, emerged from the same ford, and reported it waist deep, the two men came up wet and shivering and the young woman soon after, shivering certainly but not wet which was a mystery, and after a talk they started on for Bishi, we now discussed the passage, and the men opposite beckoned us to go upstream. Nden Gam volunteered to shew us an alternative track. By going up some distance on the west side and scrambling on the rocks at side, we came to a place where a huge tree stem lay out in the stream and off it he stepped into water not more than two feet deep and took an oblique line to where the men opposite stood, and we crossed easily.

There was here some more discussion as to the proper route, and eventually it was settled that the old direct route over the hill was too steep for the loads, and in lieu of it we were taken along the most execrable track I ever saw. At times we had all to help each other up places steep as

a ladder, partly by rocks and by roots, or down to the river. In two places we had to wade along the crest of a narrow shingle ledge in the centre of the stream and deep blue water on either hand.

Suddenly we came across the shanty and stores of men out for rubber, but the only thing taken was a light for a pipe. Here while halting a few minutes to give the weaker men breath, I could not help admiring the gorge and wishing I had my Rob Roy. The river was flowing though very sluggishly through a sort of rift or chasm in the hills, and in the bed at the sides were huge rocks. The sides of the gorge had jungle in every nook and cranny and its rockiness did not look so conspicuous. At every few hundred yards, there was material for a really fine picture, up-stream or down. On starting up, we took to a gully and it led up—up till our legs ached. Progress was very slow, at last after about half an hour's climb we came to where there was a small ledge of soil, about 12 feet  $\times$  8 or 10, and a spring. The Singphus were for stopping as they said we should get no more water that day or night, and when I insisted on going on they filled bamboo tubes. This was rather too good, so I told my men to follow me and fill their *stomachs*, and proceed. It turned out that the track above certainly was steep, indeed it was a case of holding one's breath now and then, but by going at it steadily we got on, and at last the track got more level, and then quite so, and as I guessed we began to descend. Two of the Singphus now went on ahead, and I soon pointed out to the guide where we could have got water down a gully. At last we espied the valley below and listened and heard the rush of the river, so pushed on down at as rapid a pace as possible, and at dusk emerged off a flat ledge on to the river. After marking the track by paper, we crossed a little knoll, and found the remains of an old camp at a cliff overhung by a rubber tree. As a large rock of some eight or ten tons had fallen on and collapsed the former hut, we voted it best to camp to one side, and finding bamboos handy, the men were soon housed. The two Singphus who had gone ahead now turned up with two large fish (mahseer) which they had netted, and came in very handy. Here again I issued a little tea all round, and we soon got to sleep. In the morning we were all surprised to find the little branch of the river that ran beside us the night before clean gone. While having a wash at the rapid not far off, I could not help every now and then remarking a deep-toned noise or ring coming from the water, I had heard this noise before in Disang at a rapid and could not make it out. It was not regular, but occurred now and then. At last I concluded it was caused by very large boulders, poised in such a way that an extra rush of water overset them against another rock down-stream, and the concussion was the sound I heard. The boulder falling back again so soon as the extra rush was somewhat abated, repeated the sound. Just above

our camp site up-stream I was shown a conical wooded island called "Khomong morang" said to be one solid block of stone? To the south lay a wooded hill called "Kumtsai kú" (*lit.* sand hill) and by degrees we emerged from a pent-up gorge, to a wide and flat open valley running east and with low hills along the flanks. Here and there to the south, I noticed horizontal lines in the forest, at about (as far as I can recollect) 100 and 150 feet up, evidently wooded flat terraces.

In some places the edge had fallen away and shewed a clay and sand formation with *bedded water-worn stones* large and small, as though the whole valley had once been filled up with this, ere the river cut down to its present level, through the gorge we had passed. Presently we came to the hut of some men out rubber cutting, who also had killed an elephant. The usual bamboo pole and conical receptacles for offerings to the Nats, was stuck up and the tail and one foot attached; a little way off was a rough platform covered with great lumps of meat being smoke-dried. I had to stand to windward while some of the Singphus selected tit-bits in exchange for opium. As the great irregular lumps of blackened flesh, were fingered, and pawed about, and nodded over, at this jungli "exchange," I couldn't help noticing that some of them looked quite as intelligent, as their owner's face. Away all around behind him, what a view! one fit for heaven more than this earth; yet this smoke-dried old fellow, though brought up there, had probably never seen it. Had passed through life as an intelligent vegetable.

In about an hour after we met two Singphus, one with a gun, and in answer, to the query "where from," the eldest replied "Khomong," which I much doubted, seeing no trace of bag or baggage; eventually after hearing that I was *not* a Government officer come to haul him up for elephant shooting, he admitted he was a rubber-cutter, out shikaring. I had guessed something of the sort as he came up (with a conspicuous swagger, about the legs).

Soon we noticed an extremely level spur from the north, around which they said the path and river lay, it became gradually quite a conspicuous feature; clouds, however, had covered in most of the ranges behind. At last rounding this spur, we came out on the Dapha Pani and a very wide grassy flat valley extending some miles towards the north and bounded on the west by the spur abovenamed, while to the east extended all along the side running north and south a *very remarkable level and straight cliff*, alluded to by Wilcox when passing there in 1827. It was so level and straight as to be more like a huge railway embankment, and at a short distance behind could be seen another. They extended thus for some miles. We passed across the open level of the valley bottom, which was all burnt *ulu* grass, and had stones and boulders rounded and polished



sticking out of the turf everywhere, coming to the river which flowed along the eastern side. Here at the mouth of the Dapha Pani near its junction with the Dihing or Diyunkha, we pitched our camp, and got in plenty of firewood as both elephant and buffalo was reported about, and the tracks seen.

Here though fairly close to Dapha Búm, I still observed the wind to be south-west and north-east watching for the clouds to pass off the crest of the ridges in vain, until twilight, when I saw that the peaks had as yet comparatively little snow on them. I had only a few minutes left to examine the higher ridges with a high power to see how far they were bare or covered by vegetation. In the very early dawn and until sunrise I again was able to see the summits, but for very short time only, as mists came out below, all over the valley, and when these had cleared off below, the hills were all clouded over. I therefore determined to go up the valley and have a look round generally wherever possible. The old Kamti and I took "Kumku nong" with us, as he knew the place somewhat. He was one of our loadmen, and the wonder to all was, how, with such thin legs, he could carry his load and walk as far and fast as the best of us. One good feature about him was, that there was generally some information to be got from him, and at the least, he had a joke and a grin, always ready. In former times when a strong young man, ere he had small-pox—he had been up the Dapha Pani hunting—as far as the water parting towards the north-east up the "Shi kha." He described it as having jungle more or less everywhere, with tracks and paths, but not a nice country to have to push through rapidly as in travelling, in consequence of the frequent detours necessary to avoid impassable gullies &c. Otherwise as a place to quietly camp and shikar about in, it was all right, if one had some rice, for there was a good deal of game, among which on the upper ridges there was "Takin."

As we went up the valley the signs of erosion and deposit were very conspicuous all round. Our progress except for a few yards here and there, was at first entirely over large rounded stones, and the stepping from stone to stone for an hour or so on end, is monotonous. At last we spied smoke, and then saw two men watching us from our left, Miju Mishmis as it turned out, and we at once hailed. They said they had seen the smoke of our camp, and were going to see who we were, and to examine their fish traps. One of them had a fine cross bow, the other a long and beautifully made Mishmi spear. Both had the regular Mishmi basket, or haversack, that lies in the small of the back and is usually covered with bear or monkey skin. We looked into their cunningly made hut as we passed; a wild animal would hardly notice it, being part and parcel of a great snag or drifted tree, stem and roots, with stones and turf added. Thence we went along in

the *ulu* grass, on one of the many flats on which here and there a few small trees grew, but our course all the time was northward up the valley, and parallel to the river, which in an endless series of roaring rapids, winds and twists down the eastern side of the valley at, or near, the peculiar cliff that borders it all along, on the east. At the mouth, the Dapha Pani valley may be a mile and half wide, and the length 7 or 8, the entire floor being a flat, covered by *ulu* grass, and a few scattered trees, among which water channels, lined with rounded boulders and stones, meander. One could gallop on horseback almost anywhere, as far at least as the jungle was concerned, though the great (and small) rounded boulders projecting from the burnt turf, and in the grass, would not be nice to fall on. After going about five miles and still not coming to the end of the east cliff I sat down, and had a good look at it all along, with the binoculars, at the distance of about half a mile. From what Kumku nong said, there is only one passage up to the plateau above, in the whole length of about seven miles, and the top is perfectly flat and level to the foot of the second cliff, and thence flat again for a long way in, the entire plateau being called the "Mbong Yang." The edge of the cliff being perfectly level and straight for such a distance gives an extraordinary importance to it in the view, even though it is wooded all along the edge at the top and for part of the way up from below, all over the talus, which extends the whole way also. The upper half is precipitous and though here and there ferns and creepers hold on, large portions are quite bare and red, showing the clay and rounded boulders of which it is composed (for the upper half at least). Towards our camp where the river is cutting the base of this cliff, the lower third of the height is of vertically bedded clay slate and shale, the upper part as before of clay with bedded *rolled* boulders.

The height of the cliff I here estimated at 200 feet. We returned along the western edge of the valley where the land seems to rise a little in wide flat benches, five or six feet at a time, towards the range along the western flank, which is tolerably level in the main, but not so conspicuously so; at the east cliff the benches also are not regular, altogether it looks as though the land had once been continuous between the western spur and crest of the east cliff, and that the whole Dapha Pani valley had been slowly cut out to its present depth. Among the boulders as we returned I found a fine rounded block of hornblend porphyry weighing about 100lbs. and had great difficulty in breaking it, so as to get a specimen. Though the Singphus and Mishmis see so many thousands every day, they all declared they had never seen that kind of stone before. One feature of the Dapha Pani that struck me, was, the great variety of colour, in the bed, due to the extremely clear water; the natural colour of the rocks (all more or less smooth and rolled) was brought out conspicuously as though they were

varnished. As far as I could see, none of those in the bed were in situ, even though often of large size. I had great difficulty in getting up on one monster of gneiss, which measured about 40 feet  $\times$  20'  $\times$  perhaps 15 or 16 and was one solid irregularly rounded mass, partly in the river, and some way from the cliff, and though it projected some ten feet above the water on the up-stream side, there was a deep blue basin of rushing water in front of it. Blocks of the size of a hogshead were common, everywhere in the bed, and on the bare shingle flats the size was less. Evidently the river has a rapid fall, and in the rains the floods must be heavy and violent, extending all across the valley except perhaps here and there on the flat ledges. Only a small proportion of the boulders were sandstone, most were of gneiss, and granitic, though none of pure granite; apparently serpentine and trap constituted a large percentage, also chlorite, and metamorphic conglomerate. The evening gradually clouded over, and in the night a little rain fell. Next morning was foggy until about 10 A. M., when I started to ascend the hill south of the valley mouth, to get a good view over the Mbong yang. We had to wade the river, and found the face of the hill near the bank, so precipitous that it was some time ere we got a place to climb up; I selected where there had been a landslip, as it had cleared the face of the hill of the forest and vegetation that otherwise would be in the way. We found it no easy job to get up and not very safe, as now and then, a stone slipped and bounded past, rather too close to be pleasant. At about 200 feet up, I halted, as it seemed both difficult and dangerous. An accident to any one would have been highly inconvenient, and after a good survey of the valley and making a few sketches we came down and re-crossed to camp, where I found some eight Miju Mishmis, the most striking feature as we approached, being their large crossbows.

I now heard from "Kreng sha," the one we had met before, that a colony of them had come over this year from the "Kamlang" and also I believe the Teng kha, north-west, and intended to settle permanently near the Dapha Pani, and up the Inké which falls into the Dapha Pani from the north-west having their jums on the spurs at the western head of the valley. This I was glad to hear, and told them so, as it would tend to render travelling much easier if supplies could be got from villages all along. They asked many questions, on various topics, such as the price of rubber, and if I thought they were being badly cheated by the dealers, &c. In return I also made numerous enquiries, as to routes, animals, the forests, &c.

None of them any more than Singphus seemed to recognize the name of Dapha Búm which is seen on our new maps as "Mai thai Dong," all shook their heads and had never heard such a name, their's being for central



highest cone "Wathong," a summit to the south-west "Kambro," and the continuation of it "Kunjong."

A conspicuous double peak on the snowed ridge going east, they called "Taiyún." None of them had been to the east of Wathong, and described the routes there as difficult and over snow. A party had come over probably from Bor Kanti valley, some years ago and two of the men had to be carried in, having lost their feet through warming them at a fire when frost-bitten. No one seemed to know that hard rubbing with snow might save a limb, and I described the process. As we sat talking, the clouds moved off, and we had for the rest of the day a fine view of all the hills. A peculiar persistent grey green shade, all over the lower part of Kun jong had struck me for some time as contrasting with the upper part of the same. I had attributed it to cloud-shadow, and the upper yellowish brown, to sunshine, but as it remained there after all cloud had gone, I at once saw it was caused by some change in the vegetation.

On enquiry it turned out that the yellow ochre colour was caused by dry grass and a small bamboo, called by them "Shu mu," the leaves of which turn yellowish. It grows in scattered clumps all over the hills at a certain elevation, with and above the belt of firs.

This belt could be well seen in the large telescopes and the individual trees, their branches, tufted heads, and shadows could be even distinguished. As usual with fir trees, they grew often up the steep ridges, and gullies, or ran in a line up the shady southern side of a ridge, among the snow fields, and had it all to themselves, barring the "Shu mu" little bamboo, and grasses. The takin is partial to this region, and difficult to shoot from its wariness and agility. They also report the elephant as wandering up as far as the snow at times, say 10,000 feet or more. Musk-deer and yak also reported.

The crossbows these men had, were very powerful, 5 feet long, though the stock was small, and light as possible (barely long enough for the short arrows) and had the ordinary crossbow trigger of bone. Arrows plain, and poisoned with aconite, were carried in a small tube of bamboo about 18" × 2" with a worked cover to slip on, the quiver tube being carried under the left arm and breast, cap upwards, handy. I was surprised to see no regular dao such as other tribes use, and in lieu of it they use the small nearly straight and pointed knife carried on a sheath or in one. The spears were beauties, heads well made and strong, the shaft of caryota stem or nahar wood, and the spike a foot long and thin, but strong also. Most had the basket covered by some skin, worn in the hollow of the back, the suspenders going a-la-knapsack over each shoulder, and hitched in front by the bone fastening, which fastening is noteworthy for its simplicity.

Ere leaving, one of them gave me a little knife such as they use to cut their Sali with, and in return I gave several of them little tin boxes with beads of various kinds, and bugles. Of course the guns and telescopes were sources of wonderment as usual, and they went away after giving me an invite to their future village, if I again came this way. The evening brought one of the grandest sights I ever saw in my life. The gorgeous effect of the sunset on the hills, and the snows especially, was simply indescribable. It was heightened by the contrast of the intense blue-greens, blues, and purple, of the lower ranges as they passed into shade, while the upper snow covered ridges and peaks were in a blaze of pink and golden sunlight. The sky behind being a clear and pale emerald green grey. The Asamese who were eating their dinner, came and stared at it, and variously expressed their admiration of a "snow mountain," which till now they had none of them seen. The snowed peaks retained for some time, a clear grey light that enabled the telescope to be used on them, long after all detail in the valley was merged in darkness. At night we heard a tiger hunting over the plain, and also elephants first to the north-west and then north-east and next day saw where they had ascended the Mbong yang plateau near where the cliff ends, close to us.

To-day at 9 A. M. I found the water boil at 210·10 by two tubes of B. P. thermometer, the air being 56° and we had fog till about 10 A. M. It is a pity there is no good site near for a camp opposite the mouth of the valley at 400 or 500 feet up as we should then see the hills over the fog. "Kumku nong" says that eight years ago, he was up east of Dapha Bum, near Mailam Bum, and camped for some ten days at a flat called "Mailam yang," which the others had heard of. By his account it is a high and comparatively flat tract, at the head waters of the Shi kha and near a route, from Bramakhund side to the Mung lang and Bor Kanti Shans and Kunungs, called the "Noi kong-isong" bat. He places this tableland (not large) at east-north-east of Dapha Bum.

If this be plotted on M. Desgodin's map, (Pro. A. S. B., 1880, Litho. 1881,) it should fall uncommonly near the boundary of Djrouba, the south-west corner of the boundary of eastern Tibet, which is there placed in the corner between the upper tributaries of the Mli kha branch of the Irrawadi; and the Brahmaputra (a little north of the Gulm thi).

I had (so far) considered the range encircling the Mli kha valley on the north, as very high and ending in the peak called Nam yen, (on Wilcox's map) and as an impassable barrier, with some high peaks rising perhaps to 20,000 feet on it.

If, however, it turns out (as it now seems likely) that the Mli kha, where these "Kunungs" live, drains the southern edge of a high plateau around which there is probably a range, it may be true what one of the

Kunungs told me, *i. e.*, that he had travelled northward and gone into Tibet for a short distance, that there *was* a route, though difficult, and few travelled on it.

He also stated that there were routes between the Mli kha and Brahmaputra on the one side west, and (though none north-east) others existed over the ranges to the east, going to the Disang or Sang kha, on which also Kunungs resided, and thence east towards China.

Until these tracts are examined it will not be possible to say whether or no this "Mailam yang" is a prolongation of the "Djruba plateau" or not.

While looking at a snow field this morning I was surprised to see very clearly the tracks of two avalanches, distinctly marked out, as long curved depressions having a ridge thrown up at the sides, and the snow piled at the bottom, one of them was about 1,000 to 1,500 feet in length; neither were there the day we had come.

The colour of the rock forming the crest and peaks that appeared where there was no snow, was a dark "purple grey." In the early morning ere the fogs arose and when the air was at times very steady, I could put on the telescope, a power of 300 (diameters). This enabled me to get as it were close to the summits and see detail with no exertion. Though the distance was 16 miles I could detect easily the sharp outlines of the rock, even the larger fractures or cracks, but no trace of vegetation. The first seen appeared to be grass, after which there are two kinds of bamboo, at least so the Mishmis say.

From all I could learn I might by now have reached Khomong the Singphu village on Dihing towards Bor Kamti at four or five days from Bishi and three from here, but I was told the journey was almost precisely like the part already travelled over, if anything more fatiguing; and that when at Khomong, I should see the usual dilapidated Singphu sheds, and learn very little more than I already knew. This might be partly true, but I still wished I could have gone on, the fact was that I had already pretty nigh exhausted the little stock of presents I brought, and to go empty handed, where if anywhere, presents are *de rigueur*, might not be good introduction, or conduce to future success in these quarters, so I perforce made all the enquiries I could, here and elsewhere as to what lay beyond. The Phungan or Bongan ridges that stretch away south from the eastern end of the Dapha group I saw from several places, and from the western edge of the Dapha valley, up a tall tree I had a good view, and found them pretty heavily snowed. The route to the north of these hills and over the saddle between them and the Dapha by which Wilcox crossed is called I am told the "Tsau rang" bat, and not now used as it is more difficult than the one round the south end of Wangleo, over a ridge



called Song san Búm. There are now no villages between Dapha Pani and Khomong as there were in the year 1827, though the sites are known; at the same time Wilcox's names are not always spelt correctly, for instance, his Koom koor, I saw the site of and it is Kum ku. (Ku is hill in Singphu.) Kum ku was in fact the name of one of my men, who had been born here, ere the village was removed to the Kam lang, and part of this village I hear is about to return to its old site again, under the old chief's son, (whom we had met with the five Mishmis, near the Dungan). Again Willecox's "Puseelah" just east of the Dapha múk, is intended for "Bisa la." (= Secondary Bisa), Oglok is correct but the village gone.

His "Insoong" is intended for Nchong. There are also no large villages of the Muluk tribe where he has them unless it be the *one* of Khomong Singphus. Next day I determined to shift camp to the western side of the valley ere returning viâ the Nchong Bum route, so as to avoid the gorge. We therefore packed up in the morning after breakfast, and I directed the men to go about four miles up the valley and camp on the west side, while I and the guide, Nden gam and Uren nong, started up the Dihing for a mile or so and proposed crossing the Mbong yang plateau, coming down by the only outlet known, and so across to camp, in the afternoon. After seeing all the loads tied up, we waded the Dapha—not a nice job at the mouth where the stream was strong and the stones large; the Singphus were up to their waists, so I selected a place where there appeared to be a line of big stones and stepped from one to the other, to reach each, however I had to make the attempt to step a foot too far up-stream, even then I was up to the hips, at last one of the boulders rolled over, and I went in, but was out again ere my note book got wet inside. About half a mile up-stream, we spied some Singphu rubber-cutters, on the off-bank, and saw another trophy and remains of elephant and deer, tied to it; Nden gam here pointed out the mahseer, literally and truly paving the bottom of the river, there must have been hundreds, (probably thousands,) from two to three feet long, though obliquely through the water they seemed only about a couple of inches deep.

In about half an hour after we ascended where a great rock barred our passage on the north side (or Bank of Diyun) and reached the top of the plateau after a little roundabout climbing and over undulating land.

Once on the top we found it remarkably flat, and tolerably free from jungle; it had been largely trampled down by elephants. The forest was very second-rate, few or no large timbers or straight. Some way in we came across two small burial mounds that belonged to the former village of "Bisa la;" the course lay on straight for the upper end of the Dapha valley, and as far as I could see the land everywhere was practically quite flat and had large rounded boulders embedded. At last we saw light

ahead, and expected to look over, and see the Dapha, but were all surprised to find we had been on the second terrace all the time, and now overlooked the lowest one bordering the valley; at the edge we found traces of a village in more burial mounds with a ditch around. Descending the slope which was at about an angle of  $45^\circ$  we could easily see the rounded boulders *in situ* in the sandy loam or clay (none angular). At foot of the slope, which might be 100 feet high, we came out on a sort of flat swamp or where peat and mud rested on sand and stones. Passing on we were probably an hour ere we again saw daylight ahead, and knew we were approaching the cliff, ere reaching which, we heard the rapids below.

We had come obliquely and now made straight for the edge, the men getting fits all the way from the Hingory-seed spines. Coming out at last and looking over, we were all astonished at the height, instead of about 200 feet it looked more like 400, and cautiously looking down while holding a sapling I involuntarily drew back, as I could not see the cliff face at all, and seemed to be standing out on a ledge. The old Kamti kept back some distance, and "felt as if something was pulling him over," I got to another place and lay down and thus looking over, could see the face of the cliff, pretty clean for some 80 or 100 feet down, after which ferns and such grew, then creepers and grasses, shrubs and saplings. Tree tops often touched the cliff face below. To get down was now the difficulty, "Nong" who alone knew the place, I had to send back, ere this, to the Dapha múkh, where we waded, as my belt and keys were dropped there, and now we had to trust to our wits. There was but one passage down we all knew, so we worked south along the edge. Animals go up and down this path, so we kept a sharp look out for tracks. While going thus, we were suddenly started by a loud deep growl or rumble, and saw the jungle moving, at once all called out "magui," (elephant) and Lutak saw it, so we moved on as quietly and rapidly as we could, and were glad to get past such a very awkward enemy in such an awkward situation. I was hardly prepared to find it literally true that there was no chance of getting down except at this one rift, but so it turned out, and we went on and on, till at last tracks were found to form a path or *puti*, and then out we came to where many of these converged at the mouth of a very small gully, wide enough for one at a time to enter. Here we rested and ate our lunch, and I had time to ask as to the singular feature we saw here and there, where huge Hingori trees had fallen over eastwards, at the verge of the precipice, in all cases the roots being at the *very edge*, and the stem lying in at right angles, (and none oblique), for some time it was not obvious, but at last we saw it was caused by the loss of root-anchorage on the precipice edge, and that the "Nor-westers" could thus overturn the larger trees pretty easily in consequence—the regularity of the phenomena was remarkable. The

entire Mbong yang plateau seemed covered by Hingori (*castenopsis*) and this was the great feature also of the plateau on the western flank of the Dapha valley. Ere going down I asked Nden gam to point out any traces he saw of human habitation, as it must have been once a carefully guarded point, in the old and unruly days of the Dapha Gam. Our troops indeed had to fight their way by this same gut. On looking about he at once pointed out, first a small circular burial mound and ditch twenty yards south-east of the entrance of path; secondly, a good many large trees called Modar, *Erythrina Indica*, planted to train pan on, these and the planted Wra bambú indicated a village site.

I also measured the height of cliff approximately by dropping heavy green sticks and hard lumps of clay, also stone, and counting the pulsations ere they reached the bottom, or talus, the average being six beats.

Before starting down I left my mark, in the shape of two bullets fired into a morhal, *Vatica lancifolia* or copal varnish tree, close to the mouth of pass on the south at four feet from ground.

The animals that frequent this plateau, and pass up or down, I had one means of ascertaining at this pass or gully, and carefully watched and recorded all tracks as we went down, meeting elephant, buffalo, sambur, horina, and huguri, deer, tiger, monkey, pig, cats, and what seemed wild dog. But no bear. Some way on, the path forks, becoming tolerably easy, and near the bottom we came to a coal seam, and shales, bedded at high angles. The upper part of the cliff was composed of clay, with water-worn stones and boulders embedded. From the edge we had a fine view of, and across the valley below, where we could see the Dapha Pani all along as a series of foaming rapids, and even hear it if we stood still; away on the other side of it the bottom of the valley was like a plain of grass, with scattered trees. It had been set on fire by the Mishmis, and was burning in large patches. On the other parts left black and smoking, we now and then caught sight of the men of our own party as little pigmies, moving along in Indian file to the new camp.

Looking across the valley to the western plateau, and realizing that the little stream below had slowly eroded it, one had an impressive lesson in geological time. The sun was now getting towards the West, and warned us to start on, for where the camp was, we as yet did not know.

On reaching the bottom, the river was close, and we forded it, also two other branches further, all swift but none deep. Nden gam, though a remarkably fine and strong young fellow, was a great opium-smoker, and he at once went ahead for the Mishmi hut, we had before seen, to get a light, and bamboo tube. Lutak and I followed at our leisure, and at one place passed the body of a python, seventeen feet long, that had been caught by the fire among the grass and burnt to death. Soon after, we heard a



man shouting and it turned out to be Kumkú nong looking for us, and to say the camp was pitched more to the south, so we had to turn and retrace our now weary steps, and at last at dusk got in, all of us three very tired. Luckily everything was as I could wish, and dinner ready—soup nice and hot, and I soon felt better. As I was at dinner, we heard a most peculiar noise (in the air seemingly) that gradually got louder and louder, and at last we realized it as an enormous flock of Hornbills, (the large Huang Sorai).

Neither I nor the Asamese had ever seen more than at most twenty or say twenty-five in one flock before, and yet here they were in hundreds—evidently they had intended to roost in the tall bor tree (fig) we were camped under, and all suddenly sheered off as soon as they saw our lights and smoke, settling a little way on. I tried stalking very quietly, but no use, this very particularly wary bird, or hundreds rather, was not to be caught, and they all suddenly and simultaneously flew, with a deafening noise. Ere I got off to sleep, which I did pretty early, I heard “old Kamti” at his gabbling sing-song prayers, mental sort of “prayer wheel,” as far as the real devotion seemed concerned. If addressed to me, I certainly should not have blessed him, more likely the opposite. He went in for them pretty regularly at night, all in Burmese, as he was a good Shan-Buddhist, and finished off with the usual invocatory “Om, om.”

At night we had a severe yet comical scare. The Singphus (even old Thang included) insisted that there was danger from wild elephants, and half-felled lots of young trees and saplings all about, so that the fall of them should give us all notice if anything came too near, they had also selected the bor tree as good to swarm up in emergency and notched the trunk and ribs ready. About midnight I was startled clear out of bed and tent, (with revolver in hand) by the hubbub, indeed the smash of a tree first roused me. In an instant every one was up and running about, and the cry was “hati,” “magui,” and as I at once fired, *something* went off to the right, a shot from the carbine made it go on again, and then all was quiet, and we listened, some said hati, the Singphus magui, and while one of the Asamese suggested what I also thought, *i. e.*, samber, suddenly we were yelled to from *above*, and looking up in the revived firelight, discovered master “Sin-neng-gam,” the young Singphu, hanging helpless over the said fire, unable to go up or down, and probably twenty-five feet up. The sight so convulsed everybody, that for the instant he was left there, but Nden gam soon went up to the rescue (no easy matter though) and when Sin-neng was got down, and came round a bit, he found he had no recollection of going up at all, said he must have done it in his sleep!

The shrieks of laughter this induced from my fellows, were enough to keep any wild animal away all night. Between one Singphu being so literally

“treed,” and the others shouting me to shoot, to *frighten away a deer*, it lasted as a joke some time. Next morning my fellows sure enough found it was a “hor pohu,” samber. At the same time there could be no mistake that immense numbers of elephants must pretty frequently be all over the place; it was, as one Singphu said, all “hati gaon.” About 10 A. M. we started to find the return path that led over the west plateau and the saddle between Nchong Búm and Joithó, we were hours at it, and came again and again out at the same place; at last going up the spurs towards the Mishmi jums, where after about two hours, we emerged, and found them all clearing the jungle.

These Mishmis do not cut and slash so vigorously as the Nagas when clearing, but go to work quietly with their small knife daos, and get through a great deal quickly, I noticed that they left a great deal, such as bamboo clump stems standing, that Nagas would have cut, but they pile small stuff about them, and when dry the fire does the rest of the work for them. Looking at their work from a prehistoric point of view, I could well imagine that a very small cutting implement aided by fire, could really make extensive clearings, for if the fires are made around the larger tree stems, it soon kills them, and in about three to four days the whole of the foliage is dead, and in a week is ankle deep all around underneath, and the *shade has disappeared.*

The study of the dao is worth pursuing, and might be expected to yield some results (so far unknown to us) regarding the stone age here, there are many forms more or less serial, and related to the Asamese “Pat kutar” (lit. leaf-axe) and the Andaman p. axe. Both are forms that could be closely imitated in stone. Illustrations of a few are given hereafter. Celts also are found all over the hills during juming, but regarded with superstitious awe. At several places as we came along we found large clumps of the planted Ura bamboo, indicating old Singphu village sites, and at one place in particular where Wilcox places Koom kur near the upper edge of the western plateau, saw as many as five or six large mounds, say forty feet across and six high, around which large ditches were dug leaving as usual at four opposite places, little causeways to cross by, most of these mounds had bamboo clumps on them.

It was now past midday and we had only just found the entrance to the path on the plateau above, I had upbraided the Singphus and “Uren nong” especially whom the Bishi Gam had given me as guide and a safe man. It now turned out that it was about ten or twelve years since he had been by this path, and the country was so trampled about everywhere by wild elephants that he continually lost the track. Every now and then we had all to sit down while he and his men scouted around to find it, and from the edge of the plateau on the west overlooking the Dapha valley I

had several good views, not only down on, and along the same, but over the Mbong yang plateau beyond, to the east. The long level cliff was very conspicuous, wooded to the very edge, and the second line of cliff behind, which was more pronounced on its northern extremity towards the Dapha group, and where the plateau was also bounded by another cliff, not quite so regular.

Some distance beyond the second terrace to the east a third was visible, and beyond all, far off another much higher and also flat-topped. The southern end of which was broken up, and at last consisted of a few isolated low hills, rising above the lower level.

They report the Mbong yang plateau altogether to be a good day's march from east to west. From here also, the continuation of the Dapha group eastwards was well seen, ending a long way east-south-east, in the Phungan ridges, snow covered, and which (in the view) closed up to hills along the south side of Dihing and distinct from Patkai (which was behind) and not now visible, though I constantly endeavoured to see it.

The ridges and flats west of Dapha do not appear at all regular, at least we several times had pretty stiff climbing among spurs and gullies, eventually, however, we came to where the land for a long way was very level, and the path well defined, and here, as on the "Mbong yang" the Hingori tree so predominated that the spined seeds, or seed cases, caused exclamations at every step; being shod I did not feel them. It was getting well on in the afternoon when we came out on a sort of natural clearing, and finding there was water to the south in a slight depression, determined to camp, though we had come such a short way, as we should not find good ground for it at the Nchong kha. The site here was covered for about twenty acres or so, by rank long grasses, now withered, and trampled down by elephants until quite open, a few large trees being scattered here and there, and it looked like an old Júm site. Several immense thistles stood dead, with the leaves fallen over and hanging close to the stem, the head branched and carrying the well known seeds. To make certain I cut several down, and took off the heads. The total height was from 15 to 18 feet in one case, and the hollow stem, 2" diameter. None of the Asamese had seen them before, nor had the Kamti, or Singphus (so they said). It certainly seemed out of place in these forest jungles, and it occurred to me as having come transported on the north-east winds from the upper open ridges of the Dapha Búm. There were only some four or five of them, as far as we saw, and all—as they stood—looked remarkably handsome and suitable as designs for Candelabra.

Very soon our camp was pitched near the little pool or sedgy hollow, near trees, and hearing several remark how very cold the water was, I found it at 43° F. I made the men fire the grass, and being very dry



it soon caught and roared and crackled till it gradually burnt out, leaving the view along the upper Dihing towards Khomong pretty clear, and I could get the telescope to work. The crests of the Phungan bearing  $120^\circ$  whereon snow lay in several large patches, and many small ones, appeared to have the hard rocky outline seen on "Wathong," indicating frost and an utter absence of vegetation. We were here much nearer this latter, and the peaks to the east at sixteen miles were well seen even with the binoculars. The deep purple-grey of the bare rock contrasting beautifully in the evening sunlight, with the light and shadows, on the snow. We were at probably 1,500 feet elevation, and the air remarkably clear and steady, so that the distance seemed really less than half what it was. The ridges bearing  $120^\circ$  were on the contrary, only about twenty-eight miles (if "Phungan Bum"), yet appeared fully twice that distance. Several times I was tempted to look on them as much nearer the Mli kha than Wilcox put them.

After all had eaten, I put on a power of 200 and shewed them all the new moon. The old Kamti, who usually carried the telescope and legs, was particularly taken and sat out in the cold for a good half hour, after the others had had enough.

I may mention that the carriage of a fairly large telescope would be no easy matter if taken as it usually stands, with long brass tube and heavy tripod legs five feet long or so. To enable me to have the advantage without the difficulties of carriage, I made a light sassaie wood square tube weighing 3lbs. and 4'6" long in which the cell of the O. G. 3"·5 fitted, the other end so made as to have the eye-piece tube and rack motion, easily attached, the tripod of a strong magnetic compass, served to mount it, and the whole when complete, only weighed about 8lbs. Having the ability to put on a high power at times, as when camped at Dapha Pani, it enabled me, often when lying at my ease in the tent, to take long excursions all over the Dapha Bum, and very fairly among the snows, "without turning a hair," so to speak. It was particularly interesting at times when the sun was behind, to take up the lower part of some of the great seams or gullies on the face of such a hill as "Bum rong" in front of the Dapha, and to trace it up higher and higher. Lower down, as a deep shady chasm filled with tree ferns, plantains and fallen rocks, water dashing over and among them, the sunlight almost shut out in parts, where a straight piece gave quite a vista in. Again, great bare slippery rocks on all sides with the stream as a snow white streak, obliquely coming down the face of one at back (evidently a waterfall in the rains). Higher up, a long chasm, filled with shingle and tree stems, and still higher, where great shoots of stone have piled in the bed, and shew the clear surface of the bedded rocks. Above again numbers of feeders fall in on all sides, and not a trace of vege-

tation, all is bare hard, glaring rock, shimmering in the hot sun. Or at another time taking "Kunjung," in the region of firs, one could wander about almost as at Shillong among the grass and boulders and firgroups; some of which were very picturesque, and at last were so well known by sight, that I could almost sketch them from memory, ending my journey of two hours or so by a visit to the snow fields on "Wathong," the return journey which in person might take four days' hard work, being done now in as many seconds.

The drawback of a high power on a *small* O. G. is that the loss of light is so great that either detail cannot be seen, or it can only be used on such an object as the moon; again, while the best small O. glasses will only stand a power of 50 and 60 diams. per inch, larger object-glasses up to 3".5 dia. will stand 100.

Here on the top of this spur we found many large rounded boulders as on the Mbong yang and all seemed to be various forms of sandstone, not the gneiss or granitic kinds seen in the Dapha bed.

Early in the morning I took the temperature of the water in the pool at 39°, no doubt it was caused by the intense radiation. At the Dapha muk I had several times taken the temperature of the river in the morning and found it generally 51° F. air being 40° to 43°. The temperature of the *soil* at the same time by springs was, 62°. The temperature of sand must fall a good deal in clear nights. In the mornings all the boulders embedded in it, had a *white* band of dry sand right round. Here and there white patches were seen, large and small; one *invariably* found a boulder just below, at an inch to 1½, the heat from which had prevented the deposition of dew, on the sand over it.

Late at night and early in the morning we had heard the rush of the Dapha river, to the east, so in starting I calculated as if marching from that river, and we got off at about 10 A. M. as I always make the people eat first, (also their own custom).

We very soon came to the Nchong stream now a little dell and with not much water, all of us had a good drink as we should not get another chance till late in the day, At one place we came on a party of nine Mishmis, and some of our people exchanged opium for rice, they were crossing from the Teng kha (Tenga Pani) to the new Júms on Dapha, one girl had the peculiar pewter or silver coronet as an inverted crescent over the forehead, several had cross-bows, others spears, and one a sword. We then crossed the saddle between Nchong Búm and Joitho, which was pointed out by the Singphu, and over a long flat tract, in which we were shewn the site of old Bishi, where Wilcox passed, and which he marks. It could hardly have been noticed but for the forest being just there almost entirely of "Kot kora," the fruit of which can be eaten, raw or dried. The present Bishi Gam was born here.

Some way on I detected a peculiar smell in the jungles, and on enquiry was told we were close to a Pung, and ere long descended into a deep triangular depression with swampy bottom, on sand. The water, of a pale bluish colour (as if diluted with shale mud) rose in an irregular jet about 6" and 8" high in a little pool and passed off as a stream. It had a peculiar saline taste, I took a sample, but later on lost it, the Singphus look on this water as a cure for goitre.

About fifty galls per minute rose. The place has been used as an elephant trap, a skull and bones lay there of one shot some time before. The Muttok Gosain now and then shikars here I believe. The Hingori seeds were all day a perfect nuisance, first one then another got the thorns in their feet, and I now ascertained why the Singphus took us round by the gorge. It was to avoid them. There are thus three quite distinct routes for passing Nchong Búm, one by the gorge which we took, and which is very nearly what Wilcox calls "impossible," another straight over the hill at once, very steep and fatiguing, so all say; and the other which Wilcox went by, and we were now on, tolerably level and easy, (bar the thorns). The men all tried sandels of wood and bark, but they tripped and caught so often, that one pair after another, were blessed and flung away, and they hobbled along here and there, like a row of cripples in preference. Eventually "Uren nong" lost his way, and I called a halt for half an hour, as the wandering about was only wearisome. On his finding it we soon after came to the Dungan kha, and as Wilcox says, it is "one continued rapid." And we emerged from it, at last! opposite the mouth of the gorge where we were all so nearly blown away. Not wishing to chance a repetition of the gale we went on and camped in a cosy corner under a big bluff that projected into the river, and where we found already, two log huts and piles of firewood, we were here very nearly at the end of our rations, and had only one good meal all round left, so they had half now, and kept the rest for the morning. During the night the wind rose and though no rain fell, we should have again fared badly if it had not been for the shelter of the corner we were in. They say that this is always a windy site, and the name is "Dungan yup."

Very early in the morning I made three of the Singphus start off at once for Bishi for rice and to return and meet us, they went very much against the grain, but there was no help for it, we then started at about 9 A. M. the load men by a detour, to avoid the steep rock, up which the Kamti and I climbed, with difficulty, as it in places overhung. As we started, a large party of men and seven women, appeared on the off-bank, from Khomong having come viâ the gorge, Lutak and I soon after crossing the bluff, met them as they emerged from the bad ford, where all the women joined hands, (held up) as they crossed, in a line up-stream, a very sensible plan.



Hardly one of the men, and none of the women had ever seen a European before, so I was considerably and closely criticized. Many brought over daos to exchange for salt, to carry which specially some of these strong girls had been brought over, and were to take back 2 maunds each, *i. e.*, 180lbs., all seemed in good spirits, however, and soon after waded the river again, and pushed on faster than we cared to follow. By slow but steady walking we at last got to "Pen" gaon, by about 3 p. m. and found that our men had failed here in getting rice, which was at famine rates, and had gone on to Bishi, where we followed, and camped at about 4 p. m. having done from near Dapha Pani, in two days, what took four in going and in a pinch might perhaps be done in one, if certain of the road. Of course we here got plenty of rice, vegetables, &c., which mainly we were short of. Some old fellows, and one who could speak Asamese, came to enquire how we had got on, and confirmed a good deal I had heard as to routes, &c. It seems the Dapha Gam, when he fled from Bishi, went to the site we had passed at Nchong búm, and was there some time, but his unruly habits and raidings obliged us to follow him up with the "Singphu expedition" and he then fled to the Mbong Yang to be safe. He was, however, dislodged from there by a party under native officers (Lola Sing Sylhetia) the Europeans being I hear, wounded *en route* near Bishi and Miao, and at last decamped for Hukong viâ Khomong, from whence there is a route into upper Turong.


It is said that for some time, the cattle that had belonged to the Gam and his people, ran wild, and even had been seen not many years ago, I could get nothing certain as to this, and doubt there being any now with Mishmis, and rubber-hunters all through the hills.

Early next morning we packed up and I made some small presents, an electro-mug to the Gam, assortment of needles, tapes, and such, to his wife, &c. The load-men I paid, Rs 6 each for the trip of about eleven days, and gave them some opium in, I should like to have been able to be more liberal, but there are many incidental expenses connected with an expedition of this kind that swell the sum total, to no small amount ere all is over. What would be considered extremely moderate, by Government, or to any subsidised expedition, may be heavy on any single individual, especially when no return in the way of profitable trade is yet possible.

Passing west for Loang village we first saw the site where these Singphus devoted offerings to their demons or nats. It was a picturesque site among some tall Jutuli trees that threw a more or less mysterious shade on the cleared space below, where there was a house some 330 × 12, of the usual kind, and the skulls of buffalo here and there tied to the tree stems, as relics of the feasts and offerings. Singphus are grossly superstitious, and their entire belief seems to consist in a series of demons who

must be propitiated or evil results will follow. The slightest pain or sickness, is considered the work of a Nat, and must be counteracted by an offering of eatables, a bad spleen will therefore cost a man of standing seven or eight buffaloes, ere he is killed or cured himself, and the chances of the latter are small.

Any ordinary native doctor should here make a fortune in a very short time, as the people are ready to look on all drugs as charms, more or less, and pay accordingly. In a rice flat west of Bishi we were warned to look out for a wild male buffalo that was gradually becoming one of a herd of tame ones, and which the Singphus soon intended to shoot for a feast; sure enough as we turned into a small flat of open land we saw about eight or ten buffaloes, mostly lying down, one of these a male then got up and stared at us, gradually but slowly moving off to the edge of the scrub, where he disappeared when we were only about eighty yards off, the others all remained. As an instance, where a large and usually very wild animal can become more or less tamed, and semi-domestic, by associating with tame cattle, it was a very good case, and noteworthy to naturalists.

The very marked difference towards eastern Asam especially between the tame buffalo there, and in Bengal is due to the above, and that the large wild males so often have access to the tame herds. The Bengali tame buffalo indeed can be usually picked out at once in a mixed herd by the *degraded horns*. Smaller, more curved down, and giving the frontal region a rounder contour, the horns also are not so nearly in the plane of the face and nose, less effectual as weapons in fact. When two male buffaloes fight they first appear to circle around and take each other's measure. Then suddenly with a rush collide, their heads held down and face to the ground, the skulls meet with a fearful blow. Each then endeavours to force the other backwards using all their huge force and making the sods and jungle fly. If well matched they struggle thus for some time and endeavour to gore each other's shoulders and neck, by lateral thrusts of the horns, twisting the head round as they push, and this explains the peculiar sweeping curve the horns have as .

Once turned, the victor pursues the vanquished for hours, if not a whole day. At first, strength and weight are the elements in a buffalo's favour, subsequently speed. The wild males in Asam are at times fully twice the weight of an ordinary male as seen in Bengal.

After reaching Loang and pitching the camp, I wandered out north for a sketch of Patkai if possible, but the distance all along was haze. Coming home I saw some Singphus returning from "Turong ku," whence they had brought buffalo, and who found Patkai no difficulty. One of the party, a native of Hukong, was particularly inquisitive, and a great opium smoker.

The night was cold and windy with a little rain, the morning cold and foggy till 11 A. M. The men after eating tied a large bambu on each side of the canoe to steady her at the rapids, and we packed up for departure ; some boxes and a tent, by four men, went off by land for Bisa, and were to meet me there three days hence. We then embarked and after shooting several rapids, found that two of the men in the boat were hardly equal to emergencies ; so I landed them and several of the boxes that I desired to keep dry, telling them to meet me at Bisa, and if possible overtake those who had started first and recall the Kamti.

We therefore had only Thang as steersman, while self and servant were in the bow, several rapids we shot thus, very well, though the pace was no joke now and then, and I donned my swimming belt as precaution. At one rapid we found a second shoot near the bottom, and taking Thang's advice kept to the left side, flying down it at speed, though we bumped here and there. When near the bottom where the river suddenly turned sharply to the right, we saw to our dismay a huge snag right across our path, which he had forgotten, so using all my strength I ran her ashore in a little bay at the side, striking the shingle with such force that the canoe ran a long way upon it and we were all thrown out. The stream, however, had caught the stern, swung her round, ending in a capsize, just as we had jumped up and were pushing her off. Luckily by pushing hard as she rolled over she cleared the snag and was carried down the rapid. Running along the bank we got ahead, waded in and caught her ; but no easy job to hold and bring to shore. The lashings we found intact that had been passed over the boxes tent &c., and the two guns were safe (for a wonder) ; in fact very little was lost though everything was wet. While the other two got some firewood, I opened a cartridge, rubbed some of the powder on piece of the lining of my hat, which was dry, and with about quarter of a dram powder fired it in the air, getting fire at once ; some dry leaves and grass soon were blazing and the logs caught.

Afterwards we lit several roaring fires and hung everything we could about to dry. My man at once started a kettle of tea and we got on very fairly. Our great anxiety, however, was to dry our clothes ere night, as rain threatened. Thang and I now got in more fuel while the servant got me dinner.

From what he said there was no possibility of avoiding a spill, and the Singphu's belief was that if we had held on, the canoe would have jammed *under* the snag and we should have lost all, and been unable to get her out. Ere dark we had a good many things dry and rain came on at night. Early next day we again got big fires going and about 11 A. M. were surprised to see the old Kamti, Lutak, our guide, and my Asamese "Milbor" turn up. Luckily for us the old fellow was superstitious, and got quite uncomfort-



able the night before, because one of the men had a dream that we had met some disaster in the canoe, so he had started at dawn and hunted upstream and came upon us, quite expecting, as he said, all he saw, and heard.

For once I was thankful as to a "belief in dreams." With their help we got the bamboos relashed, everything again stowed, and embarked, going down the first five or six rapids most carefully but getting more confidence as we went on. Certainly the way we shot some, was enough to make any one hold his breath; there was little or no danger from rocks: it was mainly from the speed and bumping on boulders, that often threw the canoe violently aside, and at times the want of room to turn suddenly where the stream rushed down a side channel. The excitement was considerable, as often from the canoe we could not see the proper channel lower down, where all was hidden by the frothy tops of the small waves. There was hardly time to speak; in fact, one could not be easily heard with the rush of the water; and each time as we emerged into the deep and agitated water below (going fully ten miles an hour), we felt a relief. By and by we reached the rapid at the entrance to "Buri Dihing" and all got out, holding the canoe as we waded, and let her down, each getting in as he came to the deep water. Now and then we had a little trouble but gradually rapid after rapid was passed till we had come down a distance that had taken us three days in going up, and camped at one of the places we stopped at when coming up. Early next morning we got off and again got over what had taken three days going up, camping close to Bisa at Kherim Pani mouth.

At Jagon we got out and procured some rice as what we had been eating was bad, having got wet. We also found time to bargain for some vegetables that we were much in need of.

At Bisa I received my *dâk* (letters); and after the land party had joined, I procured a second canoe and we all went down by water.

Nothing of moment occurred till we reached Bor Phakial, the Kamti village above Makum, where I again stopped to see the Kunungs, and men over from "Mung Kamti." They came and spent a day with me, which enabled me to collect and verify a good deal of geographical matter, and write a limited Kunung Vocabulary. These men are called "Aung" by the Chinese (so they say), and trade with them eastward. I observe that these are the race that M. Desgodin locates there as "Loutse," and says the Chinese call them "A-nong;" undoubtedly they are these people who call themselves "Kunung" as did also Wilcox in 1827. They say their tribes and villages are scattered all over the country from the Mli kha and Mung Kamti, to the eastwards, and are not confined to the Mli kha alone. They are celebrated as workers in iron which they smelt from ore of two sorts, sandy, and in lumps, like stone.

They extend somewhat to the north, and also a little southwards, and have colonies in the valley of the Nam sang or Disang, the tributary of the Irawadi about three days east of, and parallel to Mli kha.

As the trip practically ended here I may as well summarise the results, some of the information was new, and some of value as either corroborating former reports, or useful for checking them. First as to the direct route east up Dihing, or Diyun kha, past Bisa, Bishi, and Khomong for Mung Kamti, I learnt that the route as far as I went, and possibly to Khomong, was not so very difficult, was in fact much easier than I had expected as far as the Dapha Pani, being in the main a wide flat valley, and not a gorge.

From Khomong it is said to be ten days to Manchi, and the route soon leaves the Dihing or Diyun, crossing Songsan group, though between December and February snow may lie on the passes. This route or "Songsan bat," then goes to, and down the "Mung lang kha" from which a path leads north-east to Manchi, and the Mung Kamti villages. It is reputed easier than the Tsaurang bat route followed by Wilcox in 1827, north of Phungan Boom, and also shorter. A difficulty on each being that it is all uninhabited, and supplies for some ten days or so must be carried. Indeed, now there are fewer villages than when Wilcox passed; as between Pen or Kusan, and Khomong, while some five or six are mentioned by him, there are none now. The signs of former population we saw pretty often, and always where indicated on Wilcox's map; though the names are sometimes oddly spelt, thus his "Insoong" is the Nchong, "Puseelah" is Bisa-la, "Koomkoo" is Kum-ku. At each of these there were villages in 1827, as also at Oglök and Lujong.

The want of villages is insisted on, by the Singphus and Kamtis themselves, as the greatest difficulty, as people must now travel fast and have no time to spare, either to look for easier tracks, or improve those in use. At the same time it is not so very long ago that these villages existed, and that, "Lall Chand Kyah" sold his wares on the Mbong yang plateau east of Dapha Pani, as I am told.

This want of population (which is also a drawback on the route over Patkai to Namyang for Hukong), does not exist to the same degree east of the Mli kha, whence there are several routes east, over low hills, then a central ridge, occasionally snowed, and down to the Disang or Sang kha (called also Nam sang), a journey of some three days. Thence they say the route crosses a range dividing this Disang from the Do ma or Nam Do Mai, also a tributary if not the main stream, of the Irawadi, and which is known under so many names.\* East of this there are ranges north and

\* Shuc mai, Sgin mai, Shuey mai, or Shoe mai, Zin mai Phung mai Kha, Myit nge, Do Mai.

south that divide this river from another (evidently the Salwin) ; but none of them had been so far, and they seemed to confuse the Salwin and the Mikong together ; traders, however, pass east and west across the tract dividing them from the boundary of China.

According to these Kunungs and a Kamti who seemed well acquainted with these matters, the Do mai is the same as the Shoe mai and a somewhat larger stream than the Mli kha, or Sang kha, confirming the supposition of Dr. Clement Williams, and the paper on this river by Dr. Anderson (read before the R. Geographical Society some eight or ten years ago) in which he fairly demonstrated it as the main source of the Irawadi. This, and the references thereto, in Mr. Jenkins' paper and my former reports, seem to have been overlooked by Mr. C. H. Lepper when lately claiming this as a new discovery. There can be very little doubt but that Dr. Anderson is right, that the Shoe mai kha rises in Tibet. The only doubt in my mind was whether it was the lower portion (or not) of the river known north as Nú kiang. Recent observations, however, by Gill, M. Desgodin and others seem to prove that the Nú kiang and Salwin are really the same as shewn on the map by M. Desgodin.

While on the matter of routes I may mention that the Kunungs report routes north ; one of these men, indeed, had been that way into Tibet ; another route from the Mli kha, led north-west towards Brahmakund, and the Mishmi country. They could give me no information as to any from their villages towards the north-east, though it may exist. Routes south seem pretty numerous. People often come and go by them to Bamo and the Shan states, also to Hukong.

It is a noteworthy fact, and one deserving careful attention that the country lying east of Asam, between it and China, seems even in our day so little known through the absence of traffic over it, that we cannot even name the rivers in succession, with absolute certainty.

This is no doubt caused by the difficulties due to its peculiar formation. It is situated at the south-east corner of the great Tibetan plateau, where the rivers converge, and have such a rapid fall, to the level of the southern plains, in channels more or less parallel, that they have cut out deep valleys and even gorges, extremely difficult to *ford*, or *ferry*, or *bridge*, except by iron chains. Every here and there the line of route, otherwise not easy, is completely severed by a deep valley and gorge, and long detours are necessary.

Here and there on this tract we see the iron chain bridges that demonstrate the character of the obstacles, and that have successfully *linked the route fragments together* so far. The local engineering capabilities, however, are crude, and no doubt if longer spans were possible, these impassable gorges could be crossed at far more eligible sites for a route.



If one is ever feasible between Asam and say Atentse viâ Mung Kamti and the Lutze or Kunung country, it will be by the construction of a few light wire bridges, at a few selected sites at present impassable.

Even in times long past, when both the Government and people of China were, from religious motives, anxious to find easy routes to India there was none known, over this short section. Those used were the sea route viâ Quantung or Canton, the Straits, and the Bay of Bengal; the other was "the old route" through the northern deserts to Khoten and Kashmir.

In the *Journal R. A. Society*, October 1881, page 552, the Rev. S. Beal, in an article on the "Chinese Buddhist inscriptions found at Buddha Gaya" gives a list of priests and others who travelled by these routes, and are recorded by I-tsang, A. D. 671 to 690, (1,200 years ago). In one case reference is made to a party who came over 500 years before, so that even under far more favourable conditions and great inducements to find a solution to this problem in the far past, it remained *insoluble*. I attribute it mainly to the gorges and river torrents that defied the engineering capacity then available. If a route from Asam due eastward viâ Mung Kamti is ever feasible, it will be by means of light wire bridges at carefully selected points.

With the experiences of Gill, Baber, and others before us, it seems, however, doubtful now if the game is really worth the candle. The difficulty of getting out of Asam at the eastern extremity is one thing, that of getting into China is quite another. The former I have drawn attention to for some ten years as quite feasible, viâ the Nongyang pass over Patkai; the latter has I fear been equally well demonstrated as the reverse, by others who have actually passed over the country in question.

I may also here say that the idea of a "neutral zone," surrounding Asam on the east and south-east, must appear erroneous to most of those who have studied this matter, and I observe that Mr. H. L. Jenkins is ominously silent on it.

As far as the tracts lying to the east and south are concerned, I believe them to be claimed by the king of Burma. It is not so very long ago that the Burmese Woon, attempted to overreach us, and step *over Patkai* to place his boundary north, on the Namsik. Burmese influence also in Mung Kamti is equally assertive, and I heard complaints regarding it this last time, so that we may rest assured that the Burmese will be the last to admit Hukong as "neutral," even though filled by various unruly clans disclaiming their authority.

When making enquiry as to the comparative value of various routes, east and south, I ascertained that the one from Makum viâ Khomong to Mung Kamti, east, was about equal in distance and difficulties to the one from Makum viâ Naga hills to Hukong, (now commonly used and called the Tirap route). The elevations too, were much the same, and we hence

get a clue to its feasibility. When examined on the map it will be seen that this distance is about half the total on a direct line to Aten-tzu on the Kinsha kiang. One-third of this total I had just seen, presented no great obstacles, *i. e.*, from Makum to the eastern end of the Mbong yang plateau Longitude  $96^{\circ}45'$  (near Khomong). Thence to Mung Kamti is over the Songsan Boom with perhaps elevation of 8,000 feet. The Mli kha valley is pretty level (see Wilcox also) and the hills east of it have passes at about 3,000 feet leading to the Disang. Thus we know something of this route for rather more than half the way, (*i. e.*, four-seventh) and only about fifty miles remain, to join it to Gills' route. But of this fifty miles all I know, is, that it must cross the Shoemai, Salwin, and Mikong. It is a great pity that Government has not finished up the survey of Asam even within our own frontier, as far as Phungan Boom, and the head of the Dihing valley, especially as there cannot possibly be any objection locally ; and we have men such as Col. R. G Woodthorpe, R. E., thoroughly competent and probably willing for the work ; were the Surveys on our own side executed, it would go a long way towards simplifying this rather complicated question.

The possibilities or otherwise, of opening a route from Asam either direct to Aten-tzu, or *viâ* Hukong to Tali fu, and western Yunan is one thing, the advantages or otherwise of such routes compared to their difficulties is another, and a matter I at present do not discuss, especially after the late Capt. Gill, E. Colbourne Baber, and Colquhoun have so emphatically denied the value. In the present I confine myself to the borders of Asam eastwards and the passes and people around.

## Some words in Kunung, S. E. Peal 1882.

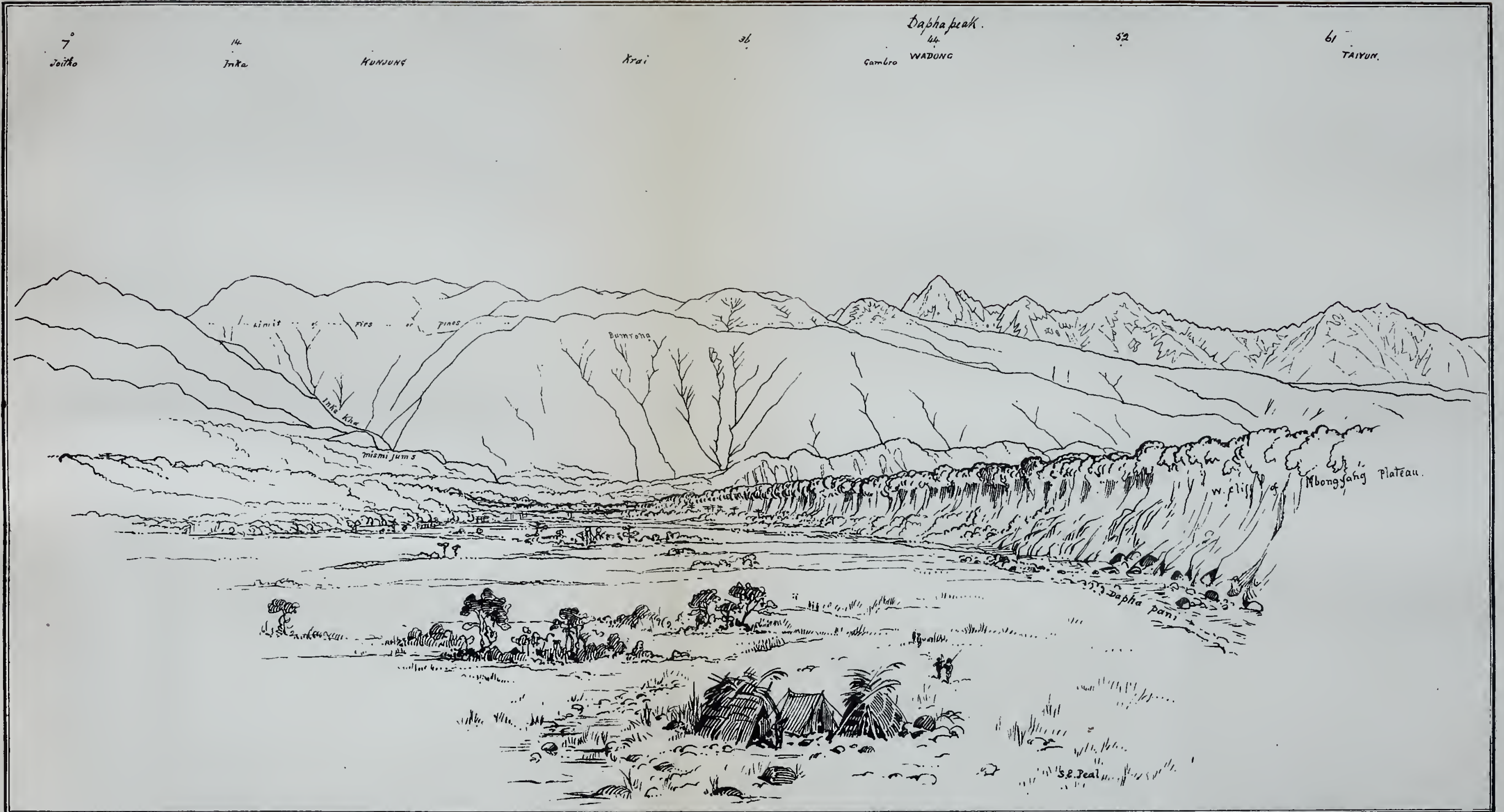
| Vowels.    | a as in Rat<br>a as in <i>Father</i><br>e as a in say. | u as oo in<br><i>poor</i> . | i as ee,                  | ch as tsh. | ai as in aisle<br>aw as in awe |
|------------|--------------------------------------------------------|-----------------------------|---------------------------|------------|--------------------------------|
| One        | ti                                                     | Ear                         | <i>a na</i>               | Neck       | nyin                           |
| Two        | ani                                                    | East                        | nam shai                  | Nail       | ling                           |
| Three      | asam                                                   | Elephant                    | magoi                     | Net        | kon                            |
| Four       | { a vli<br>{ a bri                                     | Eye                         | ne                        | Night      | a gui                          |
| Five       | panga                                                  | Father                      | <i>a pai</i>              | Nose       | sa na                          |
| Six        | kru                                                    | Fence                       | duen                      | Oil        | su                             |
| Seven      | syen                                                   | Finger                      | de gong                   | Opium      | kani                           |
| Eight      | { syet<br>{ kyat                                       | Fire                        | tami                      |            |                                |
| Nine       | tai gu                                                 | Fish                        | <i>na chi</i>             | Path       | <i>pa ra</i>                   |
| Ten        | { san<br>{ ti san                                      | Flower                      | sing wat                  | Plantain   | langu si                       |
| Twenty     | ani san                                                | Fly                         | si.                       | Plough     | pung kang                      |
|            |                                                        | Foot                        | hi ben                    |            |                                |
|            |                                                        | Fowl                        | kha                       | Rain       | su wa                          |
|            |                                                        | Frog                        | deri and dri              | Rice       | ma kum                         |
| Arm        | uur.                                                   | Goat                        | tang kre                  | Rivulet ?  | vang chi tu                    |
| Arrow      | ta ma                                                  | Gold                        | kham                      | River ?    | to sin de kha                  |
| Axe        | pa jeng                                                | Gong                        | tseng                     | Road       | pa ra                          |
| Asam       | Mong Nung                                              | Goose                       | obit                      | Salt       | sa la                          |
|            |                                                        |                             |                           | Sand       | ching phi                      |
| Bambu      | ma sang                                                | Hammer                      | to jan                    | Shield     | ta ga                          |
| Bead       | { re sit<br>{ re cit                                   | Hand                        | u ben                     | Silver     | ya                             |
| Bear       | sui                                                    | Head                        | a phe                     | Sister     | a nam                          |
| Bellows    | la sut                                                 | Hill                        | ma jui                    | Small      | nya chan                       |
| Big        | ga ba                                                  | Horse                       | mung rang                 |            |                                |
| Bird       | pa chi                                                 | House                       | kin                       | Smoke      | { ma ui<br>{ (Fr. Butter)      |
| Blood      | su                                                     | Iron                        | sam                       | Snake      | bur                            |
| Boat       | kong si                                                |                             |                           | Snow       | ta nan                         |
| Bone       | ra ga                                                  | Jungle                      | <i>a rum</i>              | Son        | a chan                         |
| Box        | tyek                                                   |                             |                           | Spoon      | ka ni ta                       |
| Brass      | syen                                                   | King                        | { n'k'm ju<br>{ r'kom' ju | Steel      | tsam and tsi                   |
| Bridge     | nam phan                                               | Knife                       | khi                       | Star       | gu met.                        |
| Buffalo    | nu ga                                                  |                             |                           | Sun        | nam gang                       |
|            |                                                        | Lake                        | si kong                   | Tea        | phalap                         |
| Cat        | ning aw                                                | Leaf                        | ta wa lap                 | Thigh      | ma chi                         |
| China      | khe                                                    | Lead                        | hik                       | Tibet      | Ching ku ga                    |
| China man  | khe a sang                                             | Leg                         | ma chi                    | Thunder    | mu din                         |
| Cloth      | yo                                                     | Calf of leg                 | mo bo                     | Tiger      | kang                           |
| Coal       | wam                                                    | Leech                       | ka phat                   | Tobacco    | ya mum                         |
| Crow       | tang kha                                               | Loom                        | yo ra                     | Tongue     | pa lai                         |
| Cotton     | pu si                                                  |                             |                           |            |                                |
| Country    | ya ga                                                  | Man                         | a sang                    | Village    | mereng guba                    |
| Cow        | pan su                                                 | Mat                         | pa lu                     | „ (small)  | mereng chan                    |
|            |                                                        | Milk                        | nung                      |            |                                |
| Dao        |                                                        | Monkey                      | a goi                     | Water      | wang                           |
| Knife axe, | } sam sum                                              | Moon                        | se la                     | War        | ta bu                          |
| Day        | rang                                                   | Morong                      | tum la                    | West       | nam nup pha                    |
| Daughter   | chan mai                                               | Mother                      | a mai                     | Wind       | nam bung.                      |
|            |                                                        | Mount                       | ma jin                    | Woman      | po ma shang                    |
| Dog        | gui                                                    | Mouth                       | noe                       | Wood       | kham.                          |



EXPLANATION OF THE PLATES.

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- Pl. I. (Not published) Cyrestis.  
,, II. View from the mouth of the Dapha Valley, N. to N. E.  
,, III. Highest peak of the Dapha or Wathong.  
,, IV. Sketch Map of Asam.  
,, V. Sketch Map of the Dihing basin.  
,, VI. Asamese Weapons.  
,, VII. Rhinoceros-hunt Scene ( $\frac{1}{4}$ th the original size) Ghormangar Cave.  
,, VIII.  
    A. Iron Spear (Chunádari Cave).  
    B. Iron Spear (Lohri Cave).  
    C. Iron Arrow-head (Chunádari Cave).  
    D. Wooden Spear (Ghormangar Cave).  
    E. Supposed Stone Spear (Likunia Cave).  
    F. Wooden Mongile from a bark-drawing by an aboriginal Australian (copied from Brough Smith's "Aborigines of Victoria").  
    G. Chip Stone Spear (Brough Smith).  
    H. Angular flake found in Caves.  
    I. Attempted Restoration of Cave Stone-Spear.



PHOTOZINCOGRAPHED AT THE SURVEY OF INDIA OFFICES, CALCUTTA.

VIEW FROM THE MOUTH OF THE DAPHA VALLEY, N. TO N. E.

JANUARY 19TH, 1882.

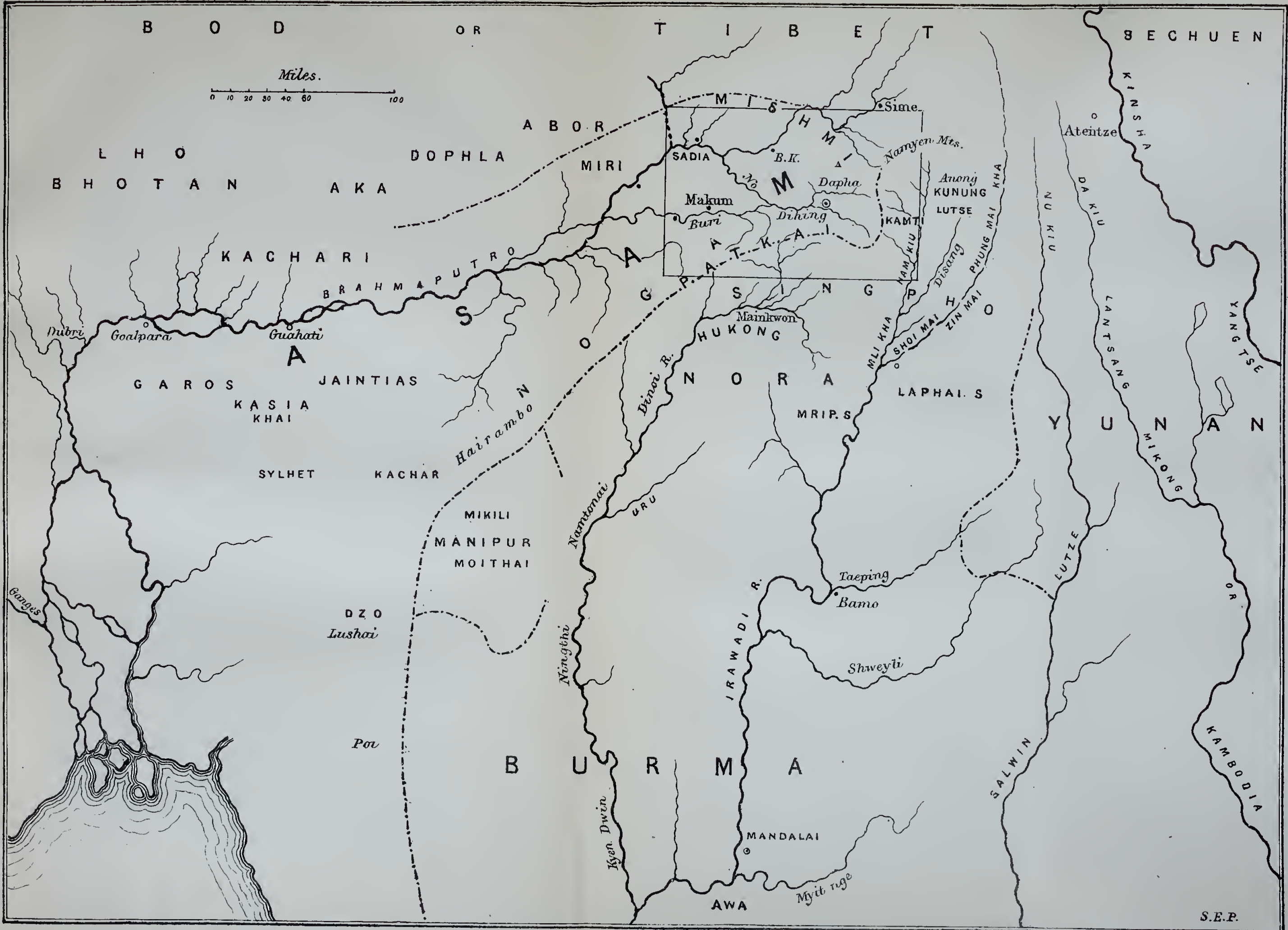


Apex as  
seen from Bisi.  
Power of 200.

S. E. Peal. Jan. 20<sup>th</sup>  
1882.

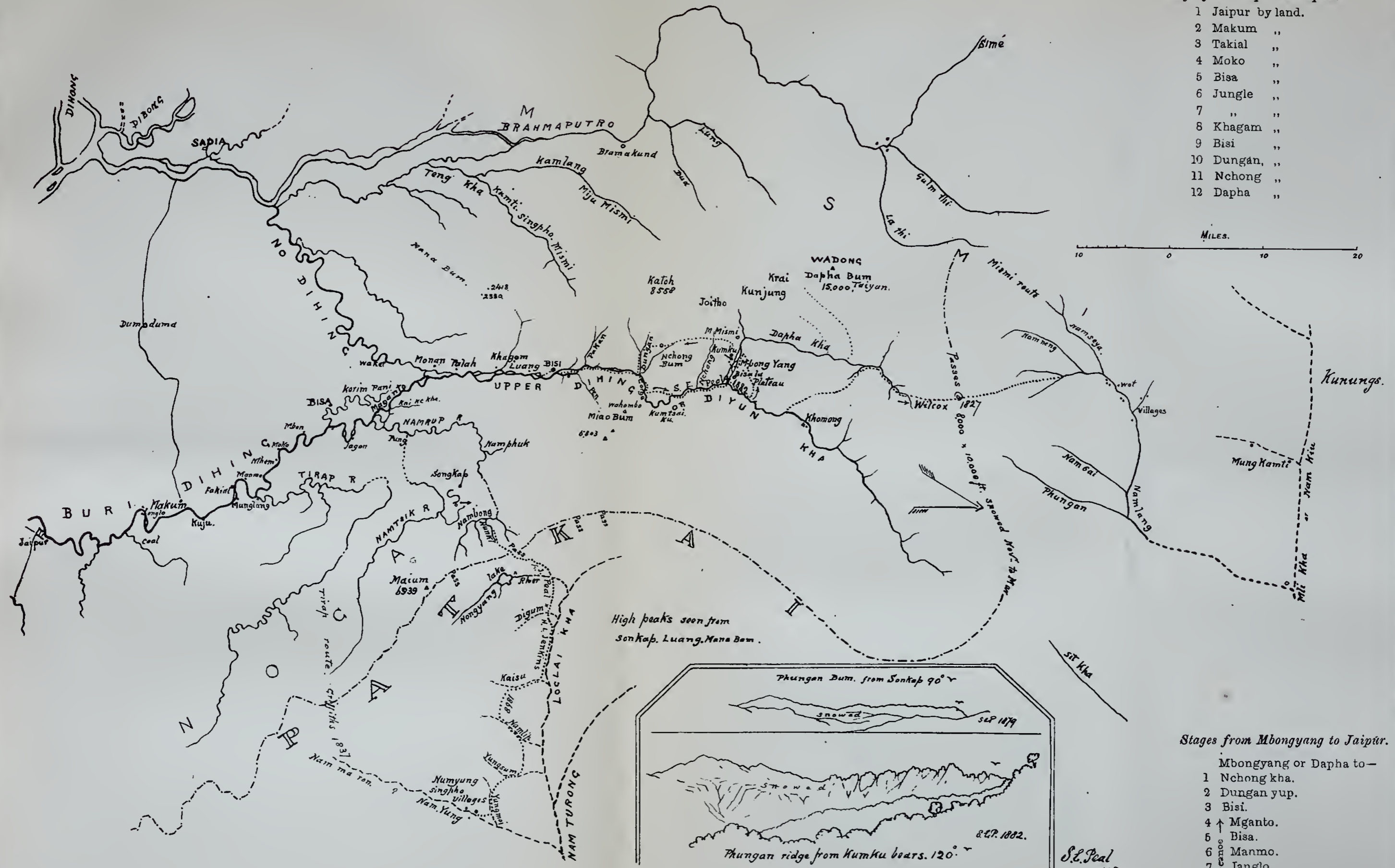
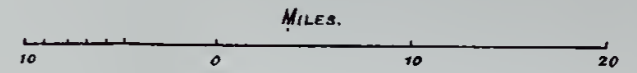
HIGHEST PEAK OF THE DAPHA OR WATHONG (15,000 FEET),  
as seen from Dapha Mukh in telescope, power of 100.



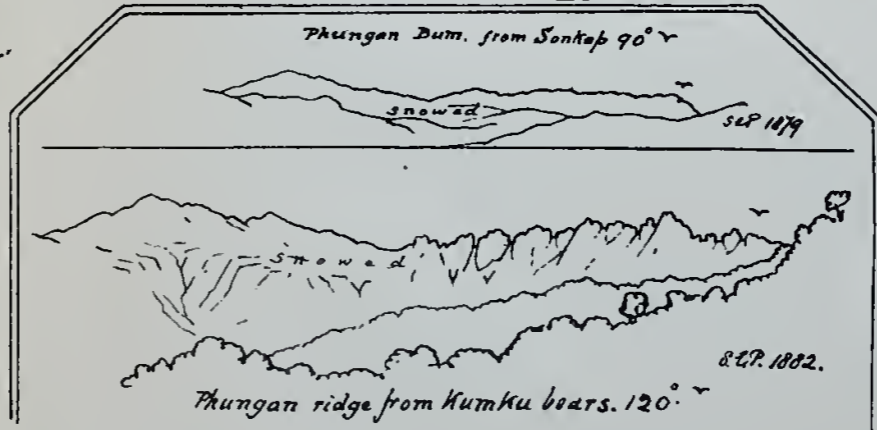


Stages from Jaipur to Dapha.

- 1 Jaipur by land.
- 2 Makum "
- 3 Takial "
- 4 Moko "
- 5 Bisa "
- 6 Jungle "
- 7 " "
- 8 Khagam "
- 9 Bisi "
- 10 Dungan, "
- 11 Nchong "
- 12 Dapha "



High peaks seen from  
Sankap, Luang, Mana Bum.



S. E. Peal  
1883

Stages from Mbongyang to Jaipur.

- Mbongyang or Dapha to—
- 1 Nchong kha.
  - 2 Dungan yup.
  - 3 Bisi.
  - 4 ↑ Mganto.
  - 5 Bisa.
  - 6 Manmo.
  - 7 ↓ Janglo.
  - 8 ↓ Jaipur.

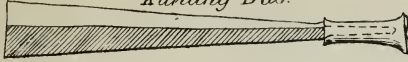
*Mish mi*



*Asamese Mit Kotari.*



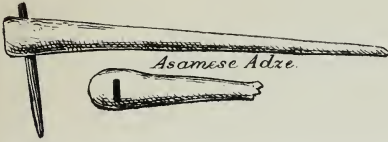
*Kunung Dao.*



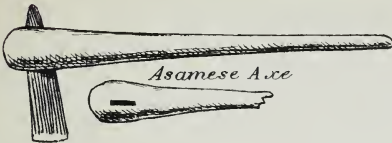
*Kamti Dao.*



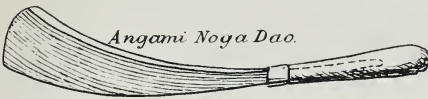
*Asamese Adze.*



*Asamese Axe.*



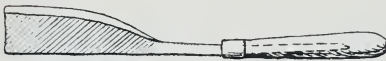
*Angami Noga Dao.*



*Kachari.*



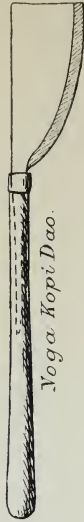
*Asamese Bogdingia.*



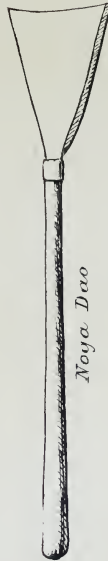
*Old Dao found underground.*



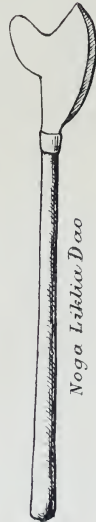
*Noga Kopi Dao.*



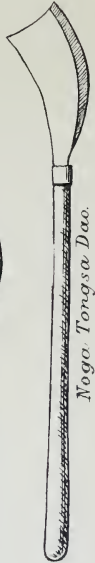
*Noga Dao.*



*Noga Likhu Dao.*



*Noga Tongsa Dao.*



Scale abt. 1 to 10.